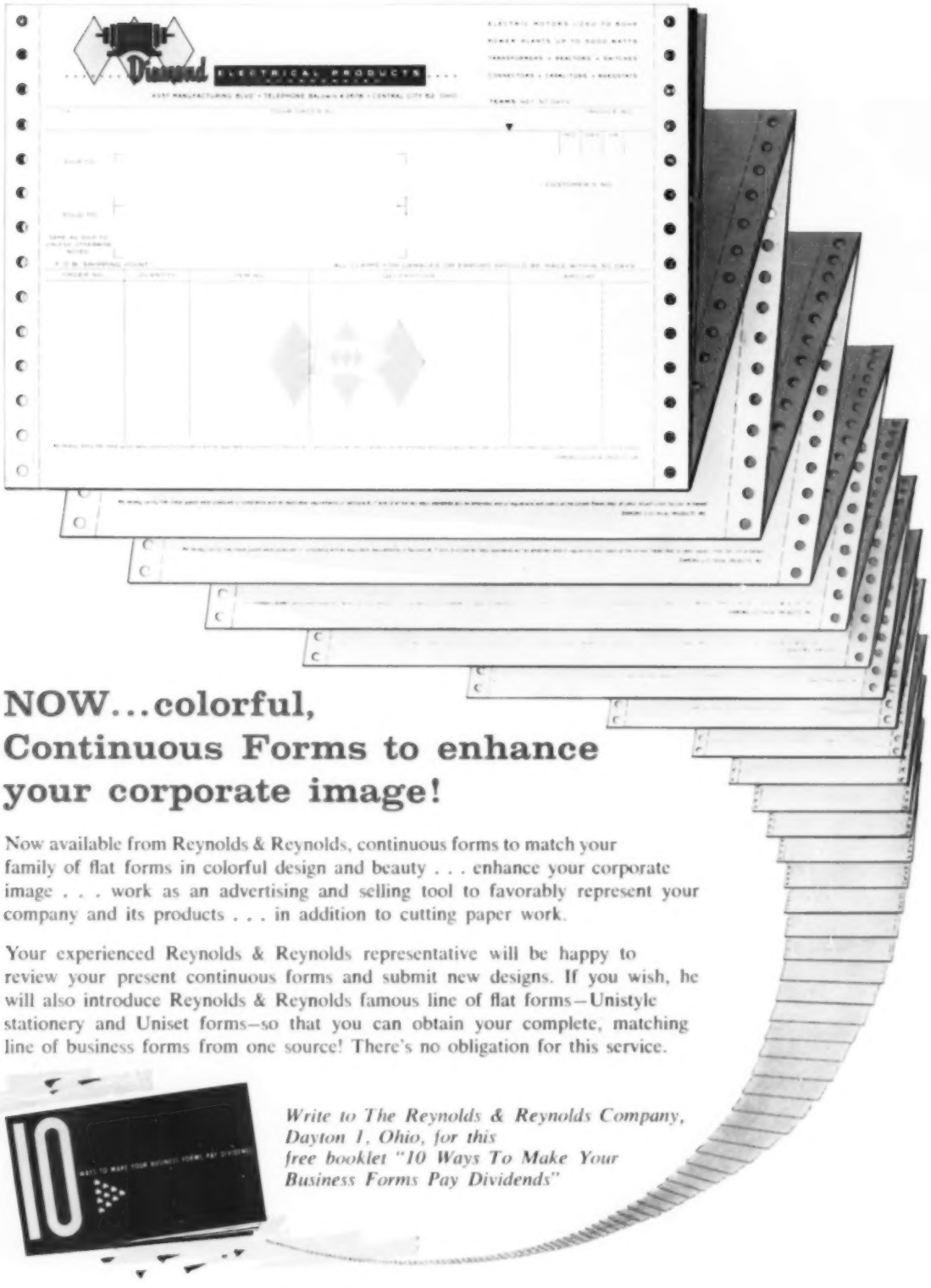
November 1960

MANAGEMENT *and* BUSINESS AUTOMATION

Information Retrieval - page 18



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ROYAL McBEE · *data processing division*

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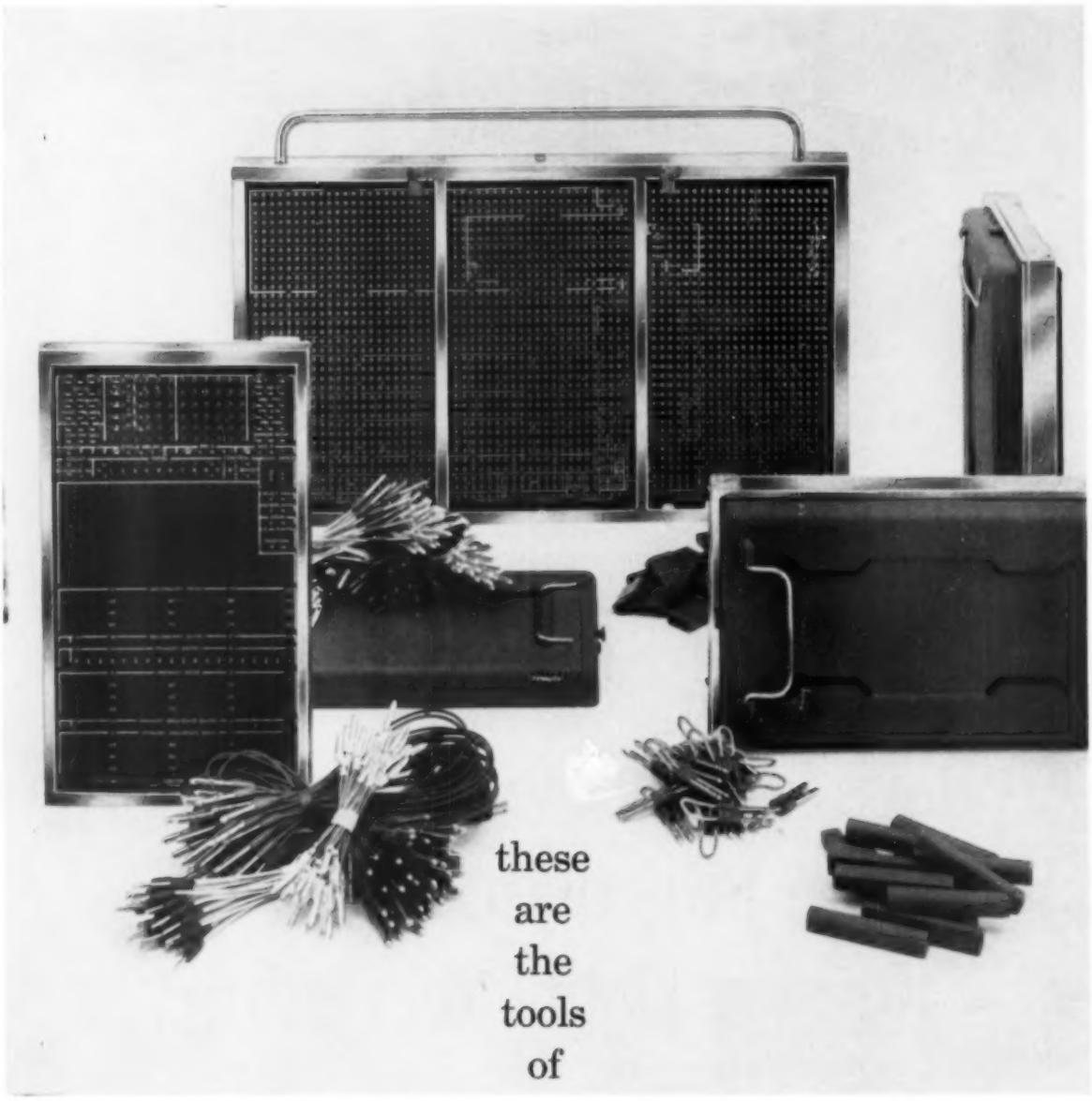

modern management!

Ever since man has had a job to do, he has found tools to help him do it easier. You, as part of a modern management team, are just as vitally interested in finding and using the tools that will create greater efficiency in all phases of your operation.

MAC Panel Company is a leading producer of quality control panels and components . . . a complete selection of precision-engineered products for use with IBM Punched Card and Data Processing Equipment. These are the tools that have been designed to perform jobs that benefit your entire organization.

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MAC PANEL

MANAGEMENT *and* BUSINESS AUTOMATION

November, 1960
Vol. 4, No. 5

New ideas, developments, applications, results, and the human impact of business automation in commerce, industry and government.

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how VERSATILE
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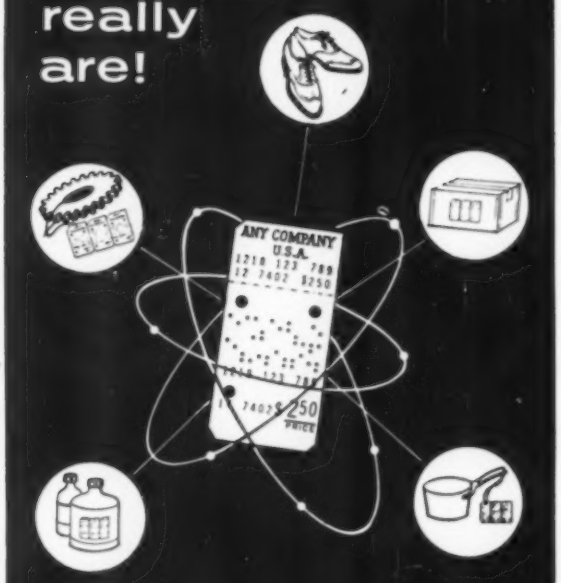

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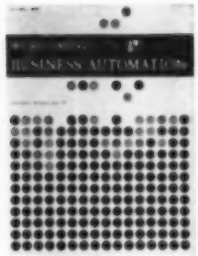
Scanning the issue



When Frederick Jonker arrived in this country from his native Netherlands in 1948, he had less than $50 in his pockets, an engineering degree and experience in the field of internal combustion engines. Then 29 years old, he started as a teacher of engineering at the University of Delaware, but soon his interest in the problems of information processing became all-consuming, and he began experimenting in his basement to perfect his Matrix principle—which had been known for 2,000 years but never fully developed. By 1958, 10 years after his arrival in this country, he was the head of his own manufacturing firm. In March of this year he raised $300,000 in capital through an initial public stock offering to put his organization in full swing. In an interview, Jonker's Approach to Information Retrieval, page 18, Assistant Editor William Christian probes the man, his system and his equipment.

The cover this month was designed by MBA Art Director Leonard Schimek and symbolizes—in abstract form—the Termatrex system developed by Mr. Jonker.

There is no "short cut" in planning the housing for a computer installation. It is either done correctly the first time, or there is going to be trouble—and expense—before too long. **Basic Elements of Computer Environment,** page 28, is a floor-to-ceiling picture of the requirements for a smoothly functioning electronic data processing installation.

Maintaining a tradition of progress—which dates back to an original charter from the Continental Congress in 1781—the First Pennsylvania Banking and Trust Co. now claims the honor of putting into operation the first, fully-automatic, electronic bank bookkeeping system in the world. The system makes full use of Magnetic Ink Character Recognition (MICR) as well as a magnetic tape computer. The planning stages, revealed in **An Electronic First at First Pennsylvania,** page 36, provides the step-by-step procedures so necessary in any successful EDP venture.

In thousands of factories across the country today, workers write their "start time" and later the "finish time" on a card which will then be used to calculate the actual minutes involved in completing a particular job. Such information is necessary for both job cost information and often for payroll. There are several new and much more automated methods of handling this task. One of them is covered in **Integrated Time and Tab Cards Speed Job Costing,** page 40. This is a story of elapsed time computers and data processing in action at the Electro Dynamic plant in Bayonne, N. J.

(Advertisement)

We Cerebrated and Decided to Tell You Our Card File Story...

INSIDE OUT!

Almost everyone knows our card files are as beautiful as Miss America, rugged as the Rock of Gibraltar, and built like a fine watch.

However, we have noticed some people have wondered *why* this is true.

So, we decided to tell you the "inside out" story of this remarkable file, which in a short time has attained a top position in a most competitive field.

So, let us start with the inside of a Tab full suspension file, and work our way out, checking over advantage by unparalleled advantage.

SUSPENSION

Take a look at the suspension pictured above. There is more here than meets the eye. First of all, there is the suspension arm. How many bearings can you count? This arm is a key to the jewel-like precision action of the file!

INTERCHANGEABILITY

But it is not the only key! Take a look now at the track. This track is the key to the almost unbelievably efficient interchangeability of Tab Card File system. You can interchange tracks in a couple of minutes with only the help of a screwdriver; thereby converting a ¾ suspension file drawer assembly to a full suspension or vice versa.

Here is just one hypothetical example of what this could mean to you: To get optimum efficiency at minimum cost, you can buy nine ¾ suspension files and one full suspension file. With a few minutes work transferring full suspension carriers to the top level in each file, you can have a battery of files like that

pictured in the illustration where the active cards are on the top level of your ten files at the most convenient height—*and have full suspension.*

Look at the drawing, where top drawers, with active cards, have been indicated in gray. You see at a glance how Tab Products suspension and drawer interchangeability allows you to develop greatest efficiency at lowest cost.

TRUE 6-POST CONSTRUCTION

The reason for this, and its value to you, is that it assures case rigidity. In turn, this rigidity means that your Tab Products File will continue year after year to provide perfect service with smooth precision drawer movement.

THEY ALWAYS LOOK NEW!

Now, let's take a look at the drawer. Note that there is a *real* handle in front and a real handle in back. The beautiful drawer front is virtually indestructible! It is not only beautiful, practical, and durable—but easily replaced at negligible cost. Think about this!

This means that your installation of Tab Card Files can always look brand new. Forever new! Who else can give you this remarkable guarantee?

CAST ALUMINUM DRAWER HANDLE

A triumph of sophisticated modern design! To see them in batteries (full suspension indistinguishable from ¾ suspension) is to grasp the visual appeal of modern business at its best!

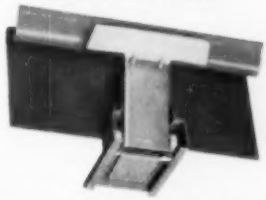
For More Information Circle Reader Service Card No. 155

FULL WIDTH INDEX HOLDER

This accepts a complete tab card on which you can write the index so large you can read it clear across the room. Even more important, when you are close to the file, you can look down at the index on the bottom drawer and *read* it. If any one else provides this feature, we would like to hear from them.

While we are talking about the drawer, notice the smooth sides: This means you can put the cards in and take them out with rapidity and ease. The channel structure of the bottom is equally important, giving the tray rigidity. The tray is so cleverly designed that with all these advantages, it is still among the lightest available.

FOLLOW-BLOCK



See the full width hand grip! Note the gnurled wheels. This follow-block stops *anywhere*—completely freed from the awkward intervals of ratchet tracks.

DRAWERS STACK

These trays *really* stack. They stay on trucks going around corners.

CONCLUSION

Tab Products Card Files, with completely interchangeable drawers, are available in 24 models. These provide an integrated card filing system at a reasonable price with 20 drawer, 14 drawer, and 10 drawer units, all optional with either full or ¾ suspension, cast aluminum (shown in this advertisement) or standard drawer fronts.

This remarkable file, like a certain motor car manufactured in England, has, as you can now see, a long list of exclusive features. But, like the car, the most valid impact it makes is its sparkling impression of *general excellence.*

Your local Tab representative will enthusiastically give you full information; or write to Tab Products Co., 995 Market Street, San Francisco 3, California, for File Brochure, Catalog 10, or Data Processing Department Planning Kit.

TAB
PRODUCTS CO.

SPACE FOR YOUR RECORDS! NO SHELVING NEEDED!

We manufacture unique new files for storing your inactive records—and no shelving needed. They are lightweight and easy to handle. Filing and finding remains a girl-size job at all times.

We call them **TANDEM Storage Files** because two trays, each 12 by 10 by 15 inches set "in tandem" in their own self-stacking bins . . . Bins actually build a framework of steel to support your records and can be stacked to the ceiling if desired.

Let us send you case histories telling how leading firms such as Republic Aviation, Esso, the Swiss Bank Corp., Maytag Co. and others have saved more than 25% of available floor space through their use.

Send for Tandem Case Histories, FREE Manual of Record Storage Practise, plus complete products catalog. Clip ad to letterhead and mail to: Dept. MBA-11.

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2607 N. 25th Ave., Franklin Park, Ill.

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Ask about
BARKLEY
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Open shelf filing is a "must" where space is at a premium for there are no space consuming drawers to be opened. Barkley open shelf file supplies make hundreds of files visible at one time; permit filing higher than eye level; permit using all the valuable floor space, and cost less to operate too. Ask us for complete information.

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Circle Reader Service Card No. 157

RANDOM ACCESS

Information bits from the Editor's memory file

Scanner Spots Fingerprints

A scanning device that can identify a fingerprint in five seconds may soon replace the human eye in the field of print identification. As reported in the New York Times, John Andrew Maurer, Jr., the New Jersey man who invented the device, explained that fingerprint patterns have great diversity, but two features occur so regularly that they may be assumed to be always present. One is the triangular formation called the delta and the other is a circular formation near the tip, resembling a group of arcs or concentric circles.

The scanning device, consisting of lenses, photoelectric cells, gears and motors, orients itself by these two features. It scans eight or more areas whose characteristics are translated electrically into a number. A computer receives the number and searches its memory to see whether the number is on the record.

Eight digits, says Mr. Maurer, would be enough to give a distinctive number for every person who might claim admission to American defense plants; nine would be enough for everybody in the United States and 10 would take in the world's population. For defense plant purposes, scanning an impression of the right index finger would be sufficient and could be completed in five seconds or less, according to Mr. Maurer. For other identification purposes, the machine could examine prints of more fingertips.

—•—

The NSEDPMOP

A new technical group, called the National Society of Electronic Data Processing Machine Operators and Programmers, has been formed in New York City.

A non-profit organization, the society was created to promote the "arts and sciences, standards and practices connected with the management, programming and operating of computers and data processing machines and to encourage research, foster technical education and advocate the exchange of knowledge between members of the society and allied professions."

Current plans call for the society to be established on a chapter basis with individual groups being formed at the firms having data processing departments. The new group is reported to be emphasizing the need of improved educational opportunities for its members, claiming that statistics show fewer than one percent of the people engaged as computer operators and programmers are college graduates.

Another feature reportedly offered by the society is a placement service through which members would be provided employment opportunities upon completion of the educational courses.

Founder of the new group appears to be S. Paul Sims, head of a New York consulting firm called Data Patterns, Inc. The society's purpose, like its name, is quite broad and a little difficult to comprehend. We'll report more on this later.

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The ability to do up to 8 jobs simultaneously

We say Honeywell 800 will process more data per dollar per working day than any high-speed electronic system now on any office floor (or on any drawing board). We can afford to say this, because Honeywell 800 lets you process up to 8 jobs all at once. And we're including *big, company-size* jobs — like running off a payroll, scheduling production, controlling inventory, or preparing a complete sales analysis. Each job has its own program, too. No complicated system of priorities or costly super-program is needed. In a way, you get up to 8 individual computers to work with.

You can see how this versatility (we call it Automatic Parallel Processing) cuts operating time and costs to the bone. To find out more about this Automatic Parallel Processing and many other design "firsts" built into Honeywell 800, just write Minneapolis-Honeywell, Datamatic Division, Wellesley Hills 81, Mass.

Honeywell

H Electronic Data Processing

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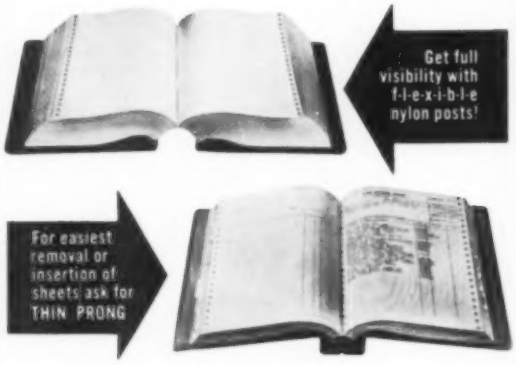

And these are only two of the styles available in the Cesco Line, which also include a binder for every purpose for holding bursted or unburst marginal punched forms. Write for your copy of Catalog "L".

YAWMAN & ERBE, C. E. Sheppard Co. Div.
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Wiley BOOKS

MANAGEMENT CONTROL SYSTEMS

Edited by DONALD G. MALCOLM, *Operations Research Inc., and* ALAN J. ROWE, *System Development Corp. General Editor,* LORIMER F. MCCONNELL, *System Development Corp. 27 Contributors.*

Covers the field of developing modern management controls, starting with current practice and continuing with descriptions of the long-range future of management control systems. It shows how computers make it possible to design new management patterns, and deals with the use of computers to simulate company activities—creating a laboratory for testing the effects of policy and procedure prior to their adoption. *1960. 374 pages. $7.25.*

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JOHN WILEY & SONS, Inc.
440 PARK AVE. SOUTH, NEW YORK 16, N. Y.

For More Information Circle Reader Service Card No. 160

from the Publisher's Desk

Two years ago the Preview Edition of MBA made its debut. We were confident that our editorial concept was sound, having researched it for over a year before introducing the magazine.

Readers were enthusiastic, too, saying that MBA was destined to fill a void which had been created by the reluctance or inability of general business and management magazines to cope with the fast changing character of business automation.

What rather surprised our editors, though, was the often-expressed doubt that we would be able to find enough solid subjects to write about over a long period of time.

This particular reaction was an early source of amusement in our editorial conferences because, even at that time, we had enough feature ideas to last for several years. Now, in retrospect, such fears are even more humorous.

Leads on suitable subjects for MBA are constantly pouring into our editorial offices. They arrive by mail, by long-distance phone call, and very often "in person." In fact, an increasing amount of editorial time is consumed in analyzing likely feature articles and evaluating their importance — one to another. Many who contact us want an editor to stop in for a visit—something we can't always do unless we are quite sure that the installation or system has top grade feature article possibilities. Still, we must give careful consideration to every worthwhile idea — even though they are manifold.

The editorial opportunities are boundless in this field. At the same time the need for a specialized and highly competent editorial staff is more apparent than ever before, if the vast amount of information available is to be properly interpreted. This is especially true because so much on business automation that appears on newspaper financial pages and in many general business magazines is superficial and at times misleading.

MBA's readers can look forward to an even more specialized and thorough publishing service than was envisioned two short years ago.

Charles W. Gilbert

MANAGEMENT and BUSINESS AUTOMATION

Publisher, Charles W. Gilbert

Manager, Marketing Services, Stanley Roy

Production Manager, Mary Haley

Treasurer, Richard M. Daugherty

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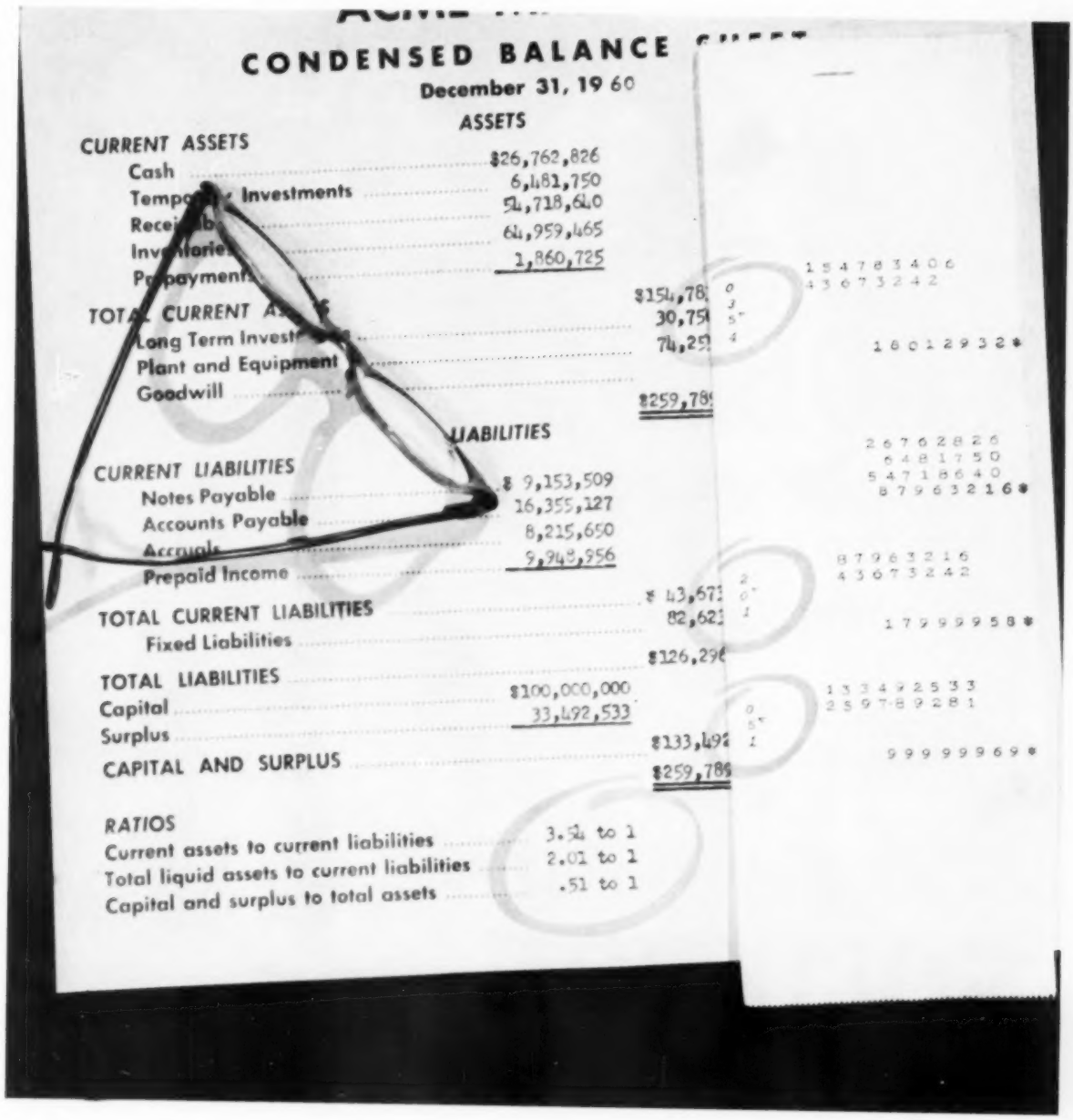

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For More Information Circle Reader Service Card No. 161

PROBLEM:

to "multiply manpower" of swiftly growing Texas Instruments

SOLUTION:

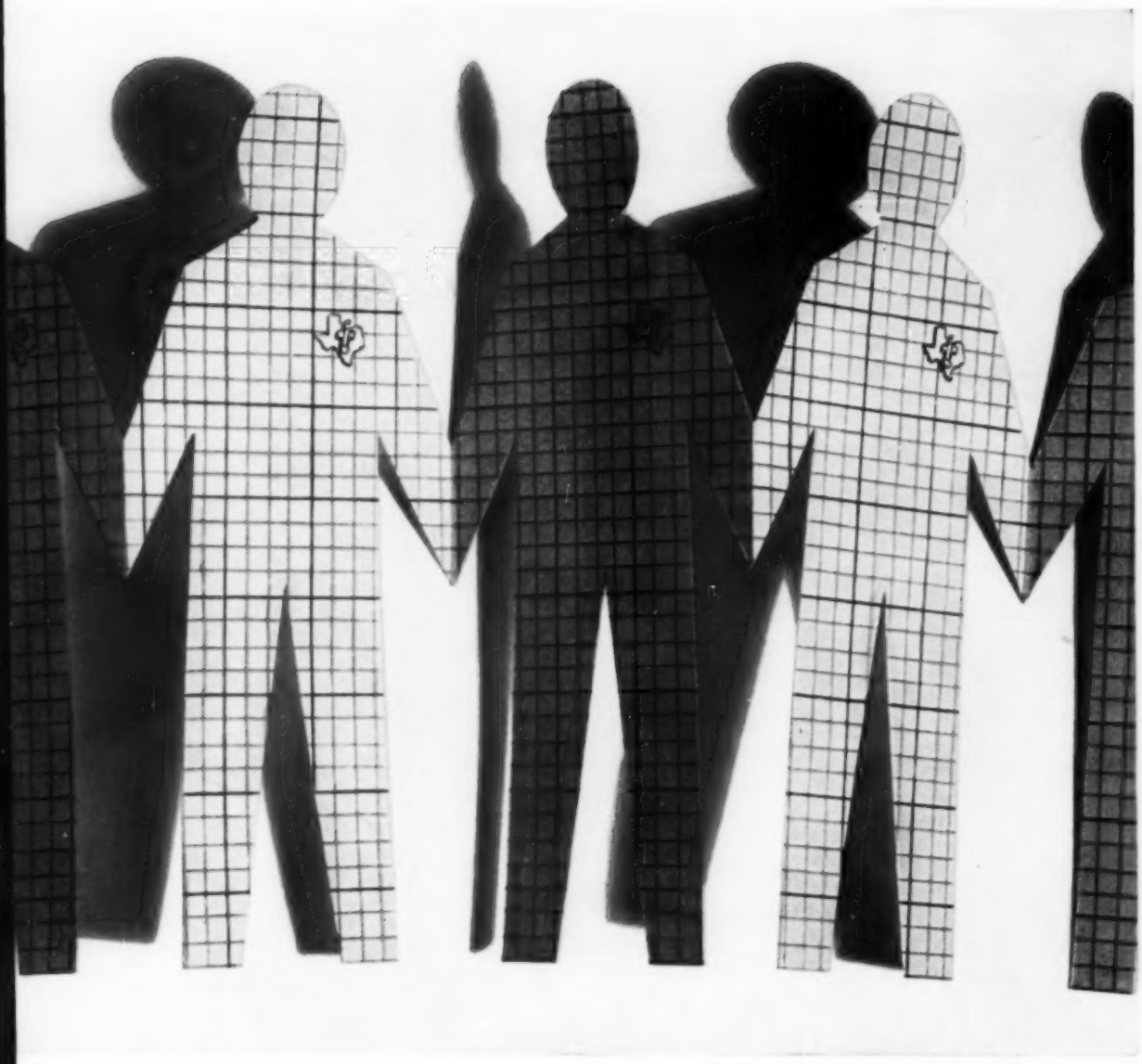
A Western Union Private Wire System

In recent years, Texas Instruments has become a major factor in electronics, with wide diversification of products and a reputation for remarkable engineering and manufacturing ability. With its dynamic growth came the continuing problem of "multiplying manpower-effectiveness" of the hard-to-come-by TI field engineers.

A Western Union Private Wire System was a major factor in overcoming this problem. It literally "multiplies manpower" by keeping field engineers in constant touch with research and development, manufacturing and marketing. This nationwide private communications network, linking 35 of the company's offices, plants and facilities, is contributing substantially to Texas Instruments' continuing growth. It is swift—it is accurate—all messages are printed, and become lasting records.

And, of particular importance to top management, the system is flexible—as TI continues to grow, the system grows with their needs. Message capacity will soon be increased by 25%, and since January alone Western Union has provided 16 new locations in the network.

Your company, too, can not only "multiply manpower-effectiveness" but save both time and money with a Western Union Private Wire System—engineered to meet your specific needs. For all the facts, wire collect to: Western Union, Private Wire Division, New York, N. Y.



How a Western Union System coordinates TI's diversified activities

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In just seconds, sales or engineering information from any one of 45 stations in 35 offices reaches this Switching Center in Dallas, which handles over 840,000 messages a year.

Message from field office arrives at proper one of several Dallas receiving stations at key areas in TI headquarters complex, is delivered immediately to the designated individual.

WESTERN UNION... first in Private Wire Systems

For More Information Circle Reader Service Card No. 162

Letters

Dear Sir:

I read with deepest interest the article by William Christian on "The Myth of the "Electronic Brain'" (See MBA, June, 1960).

Obviously, it would be more than foolhardy of me to attempt to inject myself into a dispute between scientists and especially on such a hugely complex subject as electronic data processing. However, I must say that I automatically tend to conclude that Norbert Wiener and John von Neumann are more apt to be right in predicting the future of the electronic computer than is William Christian. On the one hand we have two of the greatest theoretical scientists this nation has produced. On the other hand we have Mr. Christian, who, I rather doubt, is in the same league as Wiener and von Neumann. I think, therefore, that a reasonably wise layman would side with Wiener and von Neumann. It is my pet theory that whatever the mind of man can conceive of as a possibility—the mind of man someday will deliver as a practical development. Several of our greatest minds have conceived of the theory of a machine that actually thinks. Therefore, I believe that someday practical scientists will develop machines that think.

Oddly, just a few minutes after reading Mr. Christian's article, I came across a report of a computer development that is currently being worked on which involves the use of a "Neural Net" which will simulate the complex living nervous system. I assume that such a machine could exhibit purposeful activity—and that I believe involves thought.

So without pretending ot be entitled to an opinion, I disagree completely with Mr. Christian and I place my faith with von Neumann and Wiener. I have a strong notion that this faith will not be misplaced.

My compliments on a very excellent publication.

E. B. Weiss
Director of Merchandising
Doyle, Dane, Bernbach, Inc. Advtg.

Ed. Note: Mr. Weiss has apparently missed the point of the article. Where he has faith in the pioneer computer scientists, Mr. Christian has documented facts on the latest thinking in this field. The facts today, and in the foreseeable future, do not support Dr. Wiener's fears. The theories of Dr. von Neumann (who died in 1955) were not challenged, but presented as historical information.

Dear Sir:

May I have your permission to reproduce copies of the article "Optical Scanning—An Unlimited Horizon" that appeared in the September 1960 issue of MBA, for distribution to my class in Automatic Data Processing at American University.

W. R. Divine
Adjunct Professor
The American University

Dear Sir:

I was very much interested in the article "Optical Scanning—An Unlimited Horizon" by Arnold E. Keller, which appeared in the September 1960 issue.

I am a member of the Society of

new 50-station collator

Fully automatic . . . unprecedented performance without the penalty of high price or space waste!

Announcing a new dimension in collating versatility, accuracy, speed and compactness — the all-new, completely automatic Rotomatic by Thomas Collator Industries, Inc. If you collate in volume, you'll want all the details on the Rotomatic's ease of total operation and multiple savings. For complete information and prices, without obligation, write today.

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- Handles sheet sizes from 7" x 8" to 11" x 14" in most every weight and finish
- Offers more features at a lower price than any other collator on the market

Thomas Collator Industries, Inc.

Dept. GG4, 100 Church Street, New York, New York

For More Information Circle Reader Service Card No. 163

Insurance Accountants, an organization of stock company accountants, statisticians, etc. We have a membership of about 600 and we recently started what we call "The Society News." We have had one issue and we are looking for articles for future issues. I would like permission to reprint your article. We would, of course, give you full credit.

Edward G. Crapser
Vice President and Secretary
Pacific of New York Group

Dear Sir:

Regarding "Optical Scanning—An Unlimited Horizon," I must congratulate you on an exceptionally fine presentation of this subject in the September issue. I read your historical and technical presentation of this subject, which is today getting considerable attention from data processing personnel.

Since we hope to give this some consideration in phase two of our computer program installation, it was very informative to me. Our Windy City Chapter (Systems and Procedures Assoc.) also had this subject on the program for our September meeting. Mr. T. W. Helweg of the Farrington Mfg. Co. and Mr. Claude Yates of Standard Oil Co., presented this subject with the use of slides and a summary of the proposed use of the Farrington equipment at Standard Oil's credit card office.

C. H. Koebel
Assistant Secretary
American Manufacturers Mutual Ins.

Dear Sir:

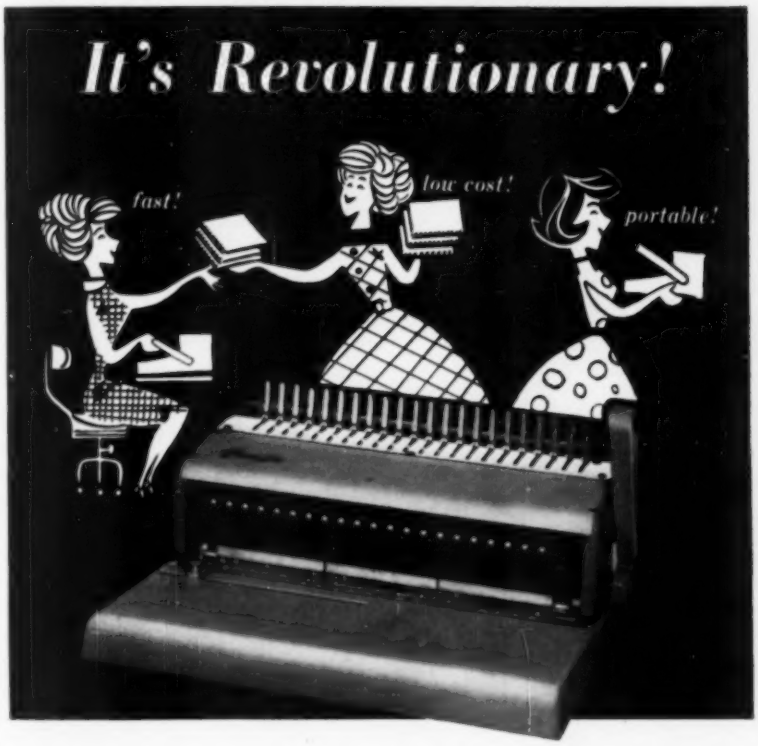
I would like permission to make about 50 copies of your editorial entitled "Who's Hoos?" which appeared in the September 1960 issue of MBA.

I am chairmaning an AMA seminar entitled "The Personnel Implications of Installing EDP" which is to be held on November 30 and December 1 and 2 at the Hotel Astor in New York City. I would like to give each participant a copy of the editorial to be used for discussion together with the original article appearing in the Harvard Business Review.

Incidentally, I would like to commend you on your rebuttal.

J. D. Elliott
Director of Central Data Processing
The Detroit Edison Co.

IT'S NEW!



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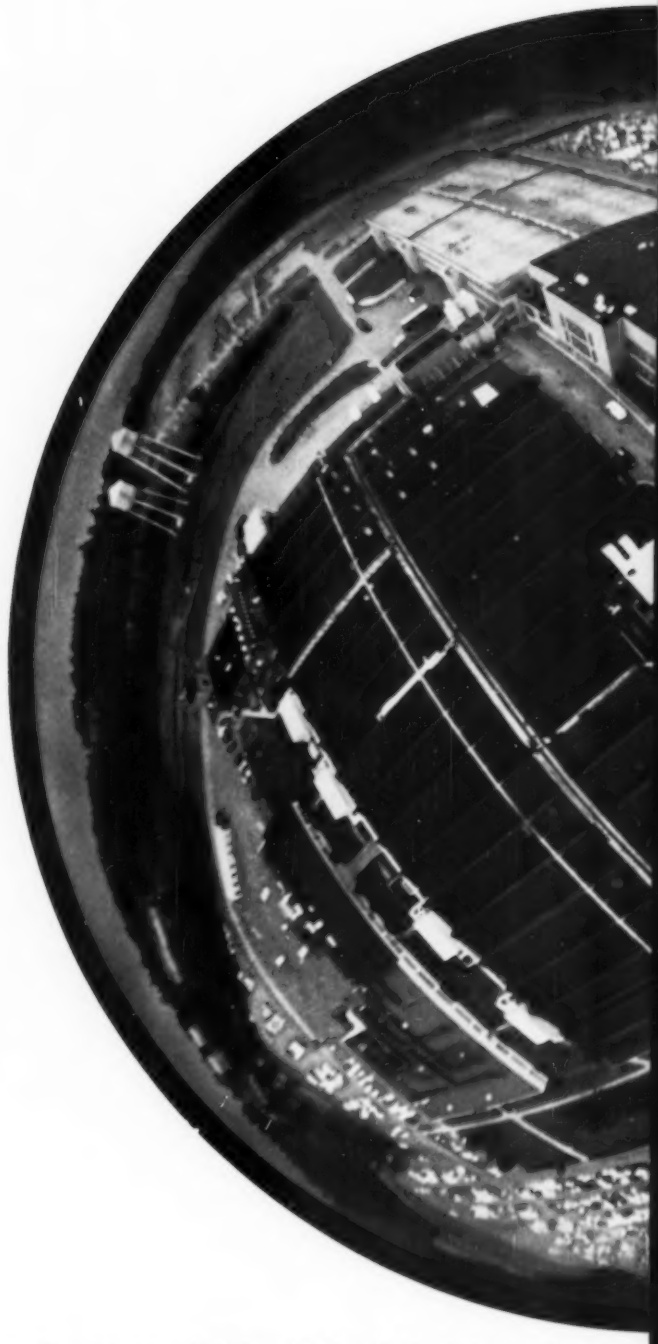
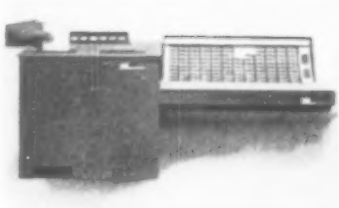
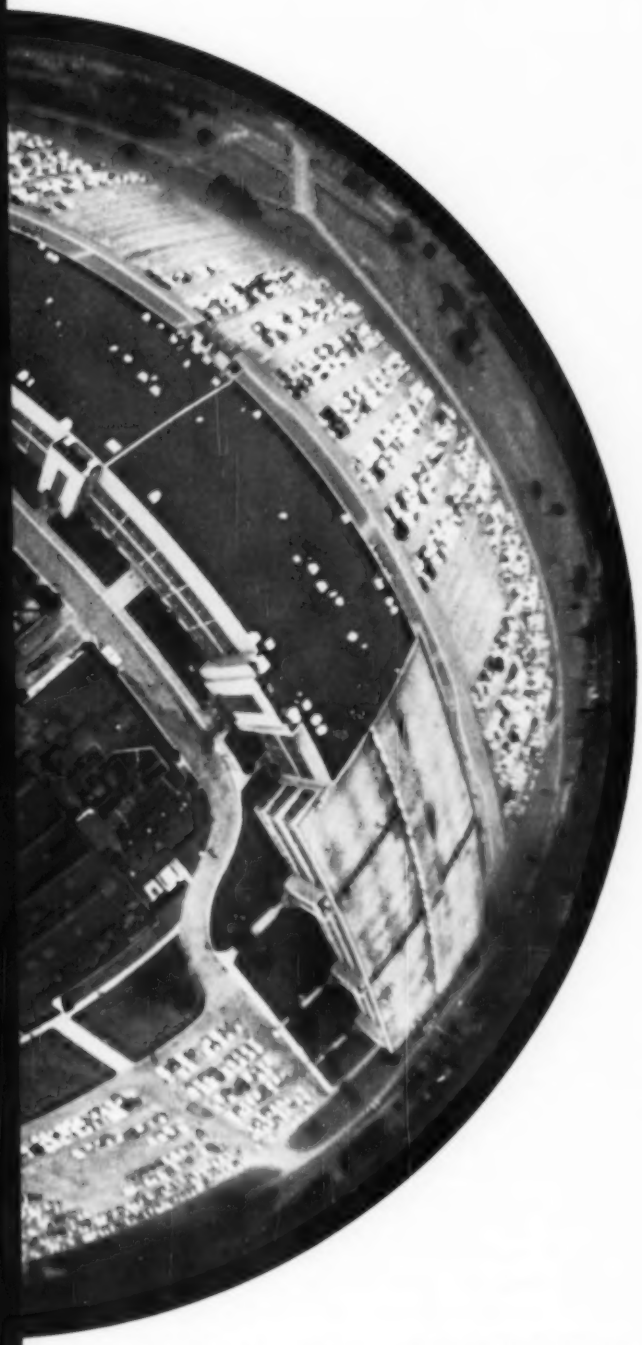


New way to get a bird's-eye view of an industrial plant



Now data from strategic points throughout a factory can be reported to a central location simultaneously. This is IBM TELEPROCESSING with the new 357 Data Collection System.

The IBM 357 Data Collection System gives management current, accurate information needed to meet rapid changes on the factory floor. And the system has just been made even more flexible: It now accepts identification data from employee badges that also serve as conventional plant badges. A new input keyboard has



also been designed specifically for an industrial environment.

Here's how this IBM TELE-PROCESSING system works: A worker in a plant finishes a subassembly. He puts an IBM card in an electronic device no larger than a typewriter and keys in information about the completed job. The production data is flashed instantly to a central receiving station. At the same time, facts flow in from similar input stations throughout the plant. All this data can feed into the plant's central data processing system.

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Frederick Jonker, inventor of the "Termatrex" system, was recently invited to appear before a Senate Committee on Government Operations to present his outline for a nationwide network for the flow of information.

Jonker's Approach

MBA interviews the inventor of the "Termatrex" system, a simple, inexpensive method of locating indexed data.

AMERICAN BUSINESS firms today find themselves at a disadvantage in their inability to channel to their own use the vast reservoir of technological knowledge which spells the difference between productivity and waste. This information, unless it is documented, indexed and easily retrieved, is nothing more than an unwieldy mass of unrelated and useless data.

The Federal Government also has its share of troubles in attempting to carry on scientific programs which require the assembling, coordinating, indexing, retrieving and disseminating of scientific information and data. Duplication of research efforts has been dramatically underscored time and time again as scientists and engineers learn they are laboring on a problem which has already been solved and the answer published.

Recognizing that the information retrieval problem exists as a threat both to national defense and industrial progress, the Committee on Government Operations of the United States Senate sponsored a study of Federal and non-Federal science information processing and retrieval programs. A report, "Documentation, Indexing, and Retrieval of Scientific Information," was released in June. This compilation of systems, equipment and ideas outlined the most advanced contributions to the I.R. (Information Retrieval) picture to date. (Available from the Superintendent of Documents, Government Printing Office, Washington

to Information Retrieval

25, D. C. Document 113, 86th Congress, Second Session. 283 pages)

It revealed that the burden of producing systems and equipment designed to solve the immense problem has fallen to the data processing industry, and already, millions of dollars have poured into research in an all-out effort to deliver an answer that will satisfy the requirements of both Government and large basic industries. Such firms as Eastman Kodak (Recordak), Minnesota Mining & Mfg., Itek Corp., Avco Corp. (Crosley Div.), Magnavox, Remington Rand, IBM, Benson-Lehner, Documentation, Inc. and Royal-McBee Corp. have made important contributions to the progress of I.R.

Fortune Magazine, in a recent article, points out that industry is now spending $2 million a year on systems that adapted conventional punched card machines and computers for I.R. purposes. Quoting IBM, the magazine states: "Expenditures on I.R. will jump to over $100 million a year by 1965, and thereafter double every three years." Systems described ranged in price from $2½ million to approximately $10,000.

"We have a different approach to mechanized information searching that we believe could become of great importance to the nation-wide information problem."

High speed and low cost

One of the business men who appeared before the Senate Committee was Frederick Jonker, president of Jonker Business Machines, Inc. in Gaithersburg, Md. He offered the committee an outline for a nationwide network for the flow of information and described the equipment he felt would handle the job.

Mr. Jonker has developed—and is now marketing—the "Termatrex" systems, designed primarily for information "finding" and "locating" purposes. These are basically single-purpose systems intended to tell where specified information can be found. His method is simple, his equipment is very low in cost, and it is considered as fast in operation as many of the more sophisticated devices which cost 10 to 100 times as much.

While output of the systems may be no more than the serial or code number of the document being searched, the ability to obtain this information at high speed and relatively low cost represents a significant advance in the art.

Because the editors are of the opinion that this development provides one answer to the complex problem of information retrieval, William Christian, assistant editor, was assigned to obtain an interview with Mr. Jonker that would detail the workings of the Termatrex system.

Question: Mr. Jonker, recently the Senate Committee on Government Operations issued a report on the nation-wide problem our country faces in the field of documenting, indexing and retrieving scientific information. This problem exists within the realm of the business and industrial worlds as well. Could you give our readers your view of the problem?

Answer: Yes, briefly it is this: The problem of

"Each item of information is given a serial number. There is one card for every term used to describe the item. Data is entered by 'drilling' the serial numbers of items into the Term Cards."

finding the required information in science and industry is rapidly becoming one of the greatest bottlenecks to progress. Already half to three-quarters of all research only duplicates previous work because it's so hard to find out what else has been done in any particular field. Until recently, the only solution to this growing problem seemed to be a huge, multi-million dollar electronic computer-like information installation for each field of science and industry. Anyone with a question would then call upon this central installation.

For two reasons, this concept hasn't been able to find much acceptance. In the first place, it would mean many existing information services would have to be scrapped in favor of this central computer system. Secondly, the organizational problems and costs seem prohibitive.

An old principle

Question: In the Senate report, you claim your company has a new approach to the problem. Would you call your method "revolutionary"?

Answer: Yes and no. We do have a different approach to mechanized information searching that we believe could become of great importance to the nation-wide information problem. The basic principle is admittedly not a new one, but we've mechanized it and applied it to data and information search problems, and we consider the results as revolutionary.

Question: Just what is this basic principle?

Answer: It is a punched card system, and basically it is opposite to or an inversion of what I call conventional systems. In conventional systems, there usually is a card for every information item, such as a transaction, a report, a test or an employe. A number of characteristics describing this item are punched out in code on the item card. We do the oposite.

First, we give each item of information a serial number. Now we have cards dedicated to the characteristics or "Terms." There is one card for every term of the "Vocabulary of Terms" used in the information collection. A system will usually have a few hundred to a few thousand of these cards. Data is entered by punching the serial numbers of items into the Term Cards.

Question: What do you call your system?

Answer: We call it the Termatrex system. It is a contraction of the words "Term," "Matrix," and "Index." The principle of looking for a light coming through coinciding holes is sometimes called the "Peek-A-Boo" principle. This name, however, makes light of a very important factor. I think that "Superimposable Keyword Cards" is more descriptive, if you want a descriptive name.

Question: How do these keyword cards help in the search for data?

Answer: We search simply by superimposing cards. For example, if you are searching a personnel file for people who have a degree in economics

who speak French and who are single, you simply superimpose term cards designated "French," "Economics" and "Single" which have previously been punched. Coinciding holes are quickly discernible—designating all employes who meet all three requirements.

Question: How do you punch the holes in the cards?

Answer: The best answer to this is an example. If a new employe enters the firm, he is given a serial number. Term cards describing his qualifications and background are drawn and placed in superimposition in the Termatrex machine. A hole is drilled through all of the cards simultaneously with a small, hand drill. His serial number is now the source of information.

Question: Everything you have described involves manual data input. How can it compete with modern automatic data input equipment?

Answer: This system is actually no less automatic at the input level than most data processing systems. Remember, in many cases the data input in this automatic equipment is preceded by a "manual" code look-up, code copying and code verification. We have no coding process. Besides, we have a system of semi-randomly filed cards and other means which greatly reduce the input labor. As a result, our data input costs are about the same as the data input cost of the "automatic" systems.

Question: Then how do you claim that your Termatrex systems are superior search systems?

Answer: In the first place, they are very inexpensive. A few hundred to a few thousand dollars will buy a system. In the second place, anybody can operate them—for example, you or your secretary can use it for office correspondence.

"The simplest form of the system could have information introduced into cards by a hand punch — yet it would still be effective."

A "poor man's" system

In the third place, it searches instantaneously. You can search 10,000 items and give an answer while the inquirer holds the phone. And finally, an information item can be entered by practically a limitless amount of terms. Also, you can search by practically as many terms as you wish. We have customers using Termatrex for engineering test data and survey data who are entering items by up to a couple of hundred terms.

Question: From what you say, it would seem that your system is a sort of "poor man's" punched card system—or punched card retrieval for any level of user. That part sounds all right, but your basic system has a total capacity of 10,000 items. Isn't this rather a small number?

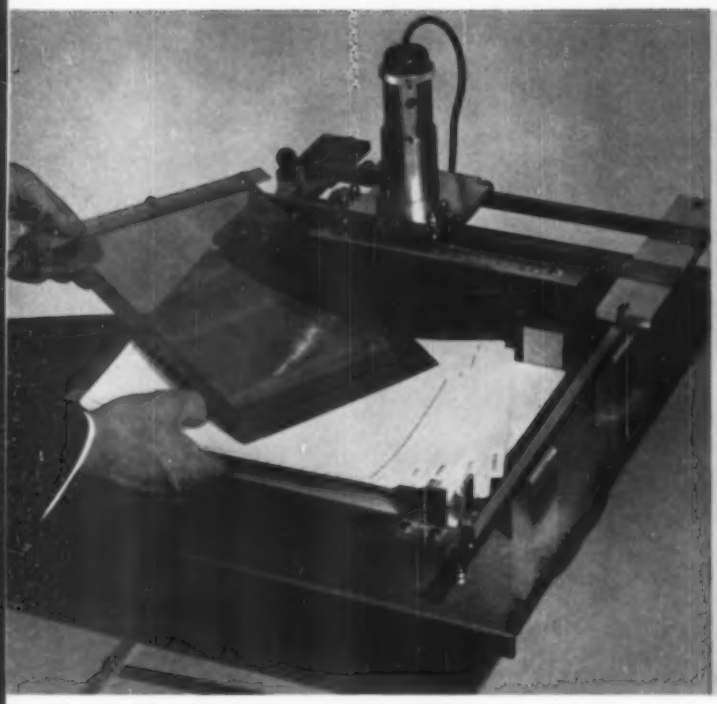
Answer: Let me answer in detail. There are many fields of application where this capacity is quite sufficient. One of them is in engineering and scientific test data. For collections exceeding 10,000 items, one can take a second "set" of cards or a third or fourth. This means, of course, that the search will have to be performed separately for each set of cards. However, we do have a system with a capacity of 40,000 items and can build even larger ones.

Question: Specifically, what do you mean by "larger ones?"

Answer: For very large collections, we are working on a miniaturized system that will have a capacity on the order of several million items. When a collection using the standard Termatrex system becomes too large, these cards can be automatically transposed to the miniaturized system.

Question: Basically, all your equipment can do is search for a combination of words, right?

Answer: No, we have worked out an extensive bag of tricks that allows us to perform practically any known search operation. As an example, we are working with cards dedicated to numerical values, ranges of values and the like. We dedicate cards to digits or letters or other symbols and work with "positive" as well as "negative" Terma-



Termatrex In Use

Present users of the Jonker Termatrex systems include E. I. DuPont de Nemours & Co., American Cyanamid Co., General Electric Co., International Telephone & Telegraph Co., Minnesota Mining & Mfg. Co., Pittsburgh Plate Glass Co., Haloid-Xerox Co., The Mitre Corp., Library of Congress, National Science Foundation, U. S. Army, Air Force and Navy.

DuPont presently is utilizing 16 Termatrex systems for research reports, test data of materials and consumer products, tabulations of survey data, spectral analytical data and color identification.

The Science and Technology Division of the Library of Congress is presently experimenting with the "large" system model which has a capacity for indexing 40,000 documents on one set of cards, each card being approximately 18 inches square. The Division is indexing some 20,000 abstracts produced by the

trex cards. It's a bit too complex to explain in detail as part of it involves the use of our "photological" equipment, but in principle we can perform any type of search.

Question: Mr. Jonker, from what you've said, it appears as though your approach is that of "going away" from electronics and represents a step backward from the general trend of the industry. How do you explain this?

Answer: Simply that the "conventional" or electronic approaches have themselves proven too slow or too complex for information retrieval purposes. We are merely switching to a simpler approach which is better suited for information and data searching. I must admit, however, that even our own equipment will soon be far from simple.

Question: What do you mean?

Answer: Well, in addition to the present equipment, we are developing a complete line of automatic data input and readout equipment, which will involve a great deal of electronics.

Question: What will this equipment do?

Answer: The automatic input equipment will take instructions from punched cards, paper tape, magnetic tape or a keyboard and enter data automatically into Termatrex cards. The output equipment will automatically scan the superimposed cards and read out the answers. Our equipment can tie into various memory devices or print-out devices built by others or by ourselves.

Question: Will this mean the equipment will apply to the standard as well as the miniaturized system?

Answer: Yes, we are planning two lines of equipment. One is electronic-mechanical for use with the full-sized system, and the other is optical-electronic, for use with the miniaturized system.

Question: It looks as if you are planning to build a complete data processing industry around your Termatrex system?

Answer: Precisely. The search function, after all, is the heart of all data processing. We have a new approach. Now we are going to add other functions—such as input, output and memory.

"Our equipment or none at all"

Question: Mr. Jonker, your company is a small organization. Just how will you compete with the bigger firms in this area of data processing?

Answer: Actually we are not competing against them. With our present simple equipment, we are serving people who cannot afford the more complex systems. For these people it is a matter of using our equipment or none at all in most cases. In the case of our larger systems and automatic equipment, we are actually creating new applications for punched card devices and computer systems.

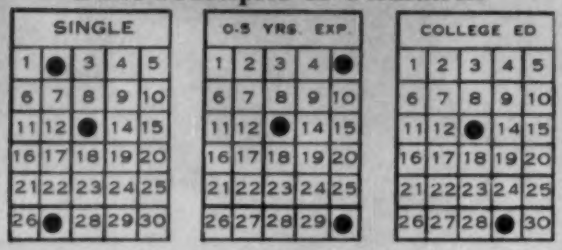
Question: How do you accomplish this?

Answer: This gets us back to the nation-wide information problem. You see, the Termatrex sys-

SIPRE (Snow, Ice, and Permafrost Research Establishment) bibliography project. The next step, under consideration, is the control, for retrieval purposes, of the Division's growing files of reference correspondence. This file embodies research that has been completed in response to inquiries in the field of science and technology, and the main idea is that repeat inquiries on the same subject can be handled without duplicated research.

In its statement to the Committee on Government Operations, the Division further said: "It is hoped that this index approach may be applied ultimately to the Division's collection of technical report literature. This collection involves hundreds of thousands of technical research reports, and should provide a substantial basis for the evaluation of the over-all applicability of documentation techniques to library problems in science and technology.

Basic Principles of Termatrex



Each "item"—be it a report, letter, transaction, a customer item of supply or employe—is given a serial number. The system is searched for items meeting a number of characteristics by placing a number of cards each dedicated to one of these characteristics in superimposition. Coinciding holes, visible as light-dots, designate the required items. Serial numbers can be read off visually or by automatic equipment.

The simplified example cards above show that employes No. 2, 13 and 27 are single. Employes No. 5, 13 and 30 have 0-5 years experience, and employes No. 13 and 29 have college educations. Obviously No. 13 fits all three requirements.

tems are simple and inexpensive enough to make it economically feasible to "distribute" them to thousands of users — complete with the data punched into the term cards. At a reasonable cost, anyone can search and utilize large collections of data in their own office or factory.

Punched card systems, computers and other electronic equipment can be best used in collecting, sorting, checking, and editing the actual data itself. On a national scale, the latter job could be handled by a number of different organizations such as a professional society or large company using computers—or it could be done by computer service bureaus. The results of the data collecting can then be merged so that it will be possible to search all the data in any field of science, say, without enforced centralization of all information activities.

It is along these lines that we visualize a solution to the major information problem that exists today.

Question: Even if you eliminate the "single center" idea, won't it be necessary to coordinate all of organizations by using the same categories and classes to index the information? In other words, will this require a new "universal" indexing language?

Answer: This is the heart of the entire problem and the basis for our solution to the whole problem. It has been proposed that such a "universal" index vocabulary covering all sciences could be developed. We, however, believe it is practically impossible to devise such a vocabulary and enforce its use. Terminology changes constantly. The meaning of words changes. New concepts are constantly discovered. This would mean new terminology for the new concepts.

A common denominator

The key to the problem, as I see it, is that all forms of terminology are based on combinations of certain words—in our case English. This basic English vocabulary is the best common denominator. Using this common denominator, I see no reason why the information problem can't be solved by cooperation and integration of efforts by all existing organizations.

Question: What you mean is that your techniques, which make use of English "words" or "terms" can, in the long run, provide the key to "universal" indexing. What about getting the "users" to index the information properly? Isn't this a problem in itself, even with English as a common denominator?

Answer: Yes, it's definitely a problem. For this reason, we must offer a wide range of services with our equipment. Everything from personnel training through complete set-ups and pilot operations are necessary. In fact, we rather discourage users from taking the system without the serv-

Continued on Page 25

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Jonker's Approach

Continued from Page 23

ices, since we feel they won't get as much out of it as they could.

Question: How many Termatrex systems are in use today?

Answer: Compared to the potential, relatively few. I will say, though, that one of the largest chemical companies *(Ed. note—DuPont Corp.)* already has 16 in operation, and this is only a beginning. We are in the process of organizing a nationwide sales force which will help us increase distribution.

The right approach?

Question: If I may ask a very frank question, Mr. Jonker, if your approach is the right one, why aren't other firms developing similar equipment?

Answer: There are a number of reasons. One is that we have been doing patent work on this approach since before 1953 and made it known that we are working on it.

Also, the military (a prime user) is concerned with huge intelligence problems and has spent vast amounts of money for the development of multi-million dollar installations. Practically no Government money was spent to find solutions to the smaller problems.

Most important, when the need first became evident, it was felt that only complex systems with complex "logical" capabilities would be able to do the job. Now, it is realized that for 90 percent of all applications, the complex equipment is not required.

Vast amounts of information

Question: But is this simpler solution offered by your equipment really adequate for the job?

Answer: Yes, mainly because it has got to be. You see, the amounts of information that will be generated in the future will soon be so vast that the country will only be able to afford only the simplest, lowest cost type of equipment for the job of indexing, data storage and information retrieval. Without a mass application principle, information will never reach the right people at the right time.

The technology and know-how is here in this country, and the information problem is one of the most important keys to maintaining our scientific superiority and the most rapid industrial expansion. By tapping our reservoir of knowledge and disseminating the information to all who need it, we can succeed in this mission. ■

About Frederick Jonker

The 41-year-old president of Jonker Business Machines, Inc. came to this country from the Netherlands in 1948 as an engineer. His first job was assistant professor of engineering at the University of Delaware. Later he was named project director in charge of mechanical projects at the National Scientific Laboratories in Washington, D. C. Attracted by the challenge and problems involved in improving information processing, particularly in the fields of science and technology, he found a position as chief engineer at Documentation, Inc. His efforts soon turned to the development of the Matrix systems of information control, and in 1958 he organized his own firm to conduct research and manufacture equipment designed specifically for data retrieval.

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5. Summary of Point Ratings for Checking Relative Rank of the Standard Positions
6. Survey Data for Determining Salaries for the Positions
7. Evaluation Chart for Determining Relationship of Actual Salaries to Point Ratings of Standard Positions
8. Analysis of Evaluation Chart for Developing a Schedule of Position Grades with Salary Ranges
9. Comparison Charts for Checking Over-all Evaluation Structure
10. Position Grade and Salary Range Record Sheets for Recording Classification of Employes
11. Procedure for the Calculation Steps Within Each Salary Range
12. Policies and Procedures for Administering the Evaluation Program
13. Area and Industry Supplemental Data

About the author

Philip H. Weber heads his own company specializing in compensation plans. Formerly with Business Research Corp., vice-president in charge of all client work in personnel field. Established evaluation plans for such companies as Cincinnati Milling Machine Co., Olin Mathieson Chemical Corp., The Northern Trust Co., Detroit Edison Co., United Air Lines, Inc., Lone Star Cement Corp., Admiral Corporation, Armour and Co., and Weyerhaeuser Timber Co. Served as president of Industrial Management Society. Frequent speaker and writer on wage and salary administration problems. Directed MBA's first nationwide study of machine accounting salaries in 1959.

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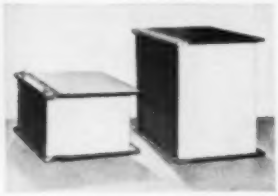

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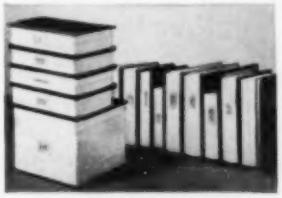

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Basic Elements Of Computer Environment

Photo—Air Research Associates

CREATING the proper environment for an electronic data processing system is a job for experts.

Ceiling height, floor strength, lighting levels, electrical power, temperature and humidity requirements are but a few of the items requiring professional direction. Others include decorations, maintenance centers, personnel facilities, visitor accommodations and future expansion.

The latter is of particular importance and yet it is the one item often overlooked or ignored. Experts advise doubling the size of any new computer area beyond the momentary needs. The wisdom of this suggestion is illustrated by the sad—and costly—experience of an eastern computer user. Five years after the original installation the firm found it necessary to expand the system. Walls had to be knocked down, new floors laid, new ceilings and air conditioning ducts hung and expensive rewiring performed. The construction work made it impossible to use the existing computer during the expansion program with the result that operations had to be transferred to a service bureau. This reportedly involved some 2,000 hours of computing time costing over $300 an hour—an "unplanned" expenditure of over $700,000.

Ceilings and floors require special consideration in planning the EDP layout. Ceilings must be high enough to allow for machine installation, keeping in mind that air conditioning demands will probably necessitate a dropped ceiling if the conventional overhead distribution system is used.

Acoustical ceilings, with walls acoustically treated down to about shoulder height are generally recommended. Many types are available in-

A computer installation can have a tremendous public relations value to a company. Attractive, long-windowed corridors permit an unobstructed view for the visitor without interferring with the system.

Raceways for cables and other facilities are pictured in this installation. Air conditioning units are located in the ceiling, and the computer units are spaced for future expansion.

cluding those with diffused shadowless lighting as well as noise absorptions. The "egg crate" ceilings with diffused lighting are popular, as are fibre glass insulated ceilings, with the fibre glass behind perforated metal. Some installations have encountered a double noise problem involving not only machine noise within the department, but the leak of that noise to other areas through air ducts. Proper insulation will correct both conditions.

Flooring your computer

In considering the acoustical treatment, special attention should be paid to the vibrations caused by some equipment. Floor and wall construction should be capable of preventing transmission of the vibrations to other areas in the building.

Even the most modern office buildings are usually not constructed to carry a floor load of more than 70 pounds per square foot (psf). Data processing equipment—especially the main frame of a computer—has point loads on the floor as high as 1,000 pounds. Even with planned weight distribution of the equipment it is necessary to design the floors for 150 psf loadings, or more.

A raised, or "floating" floor is the accepted method of solving the load distribution problem. This is actually a secondary floor raised over the building slab floor. The construction allows power cables, receptacles, temperature controls and other facilities to be concealed, yet readily accessible. Air conditioning ducts or plenuns, can also be housed in the space. The flooring comes in square or rectangle panels, usually about 18 inches square, which are supported on a structural grid (see picture, page 32) raised to a required height on metal pedestals.

Access to the under-floor area is achieved by merely lifting any of the panels, using a special suction tool which closely resembles a household plunger.

Every few feet of flooring is supplied with leveling devices to insure perfect level support for the machines. This type of free access flooring provides the installation with complete flexibility, allowing directional freedom for any expansion or shifting of equipment. A similar type of raised flooring provides raceways (see picture above) for cables and other facilities, but this would not appear to offer the many advantages found in the individual panel type.

A point to remember in conjunction with raised floors is that a ramp, rather than steps, leading up to the data processing area will make it much easier to get equipment in and out of the area. A ramp will allow the machines to be rolled right into position.

Low level illumination

Getting plenty of light on the subject is an important consideration for the machine area. The equipment manufacturers are pretty well agreed that minimum average general illumination of 40 foot-candle, measured 30 inches above the floor, is proper for the machine rooms. Direct sunlight is not desirable. The reason: easy observation of the console and other signal lights requires a low level of illumination. It's a good idea to have the general

Continued on Page 32

Coast-to-Coast Data Communications Networks

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— The supply agency of one of the major military services uses a Collins Kinetape data communications system to help maintain daily inventory control on 140,000 different items by linking a regional supply depot with the main depot 650 miles away. A single day's transactions at the regional depot are automatically transmitted via tape to the main depot computer in one hour; the former method took 10 hours and involved several manual operations.

A major aircraft and missile maker transmits engineering problems from an eastern facility via a Collins Kinecard system to its computing center on the West Coast — 2200 miles away. Computation is done at night and engineers have their answers the next day . . . four to seven days faster than before installation of the Collins equipment.

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For More Information Circle Reader Service Card No. 168

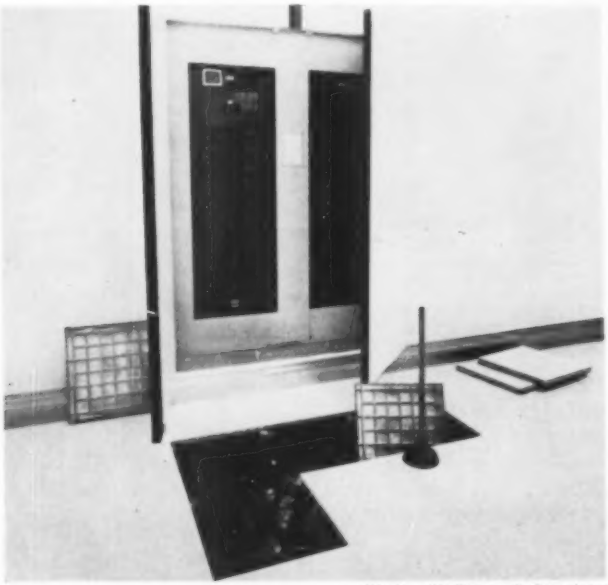
Computer Environment

Continued from page 30

Raised floors are supported by structural grid raised to a required height on metal pedestals. Rectangular panels, about 18 inches square, rest on this grid and can support heavy loads because of proper weight distribution.

Photo—Air Research Associates

Hundreds of lines and cables running under the raised floor will serve the electronic units of the system without interferring with foot traffic.



Photo—Air Research Associates

A simple suction tool can lift any section of the "floating" floor to permit easy access to the underfloor area.

lighting zoned, so that sections of lighting can be turned off and on as desired.

Electrical power requirements are a critical item. Besides requiring a tremendous amount of power, computers in particular require a constant rate of power in order to perform the high-speed computations accurately. Most experts recommend a separate feeder line for the computer, eliminating any possibility of line transients—other equipment which might periodically reduce the amount of power going to the computer. Even with separate feeders from the main distribution panel of the building it may not be possible to maintain the building power output within the proper tolerances, making it necessary to install a separate transformer or motor alternator. In considering power requirements it should be remembered that even though the available power supply is adequate for the machines, the added load brought on by air conditioning might well exceed the available supply.

Computers can't "sweat it out"

A mistake in estimating power needs can be expensive. Francis K. Green, director of design for Air Research Associated, relates the experience of a large brokerage concern, who forgot to look into the power situation and ended up paying $50,000 to bring the necessary power to the computer room.

While the new solid-state construction of computer systems has reduced the air conditioning requirements, temperature and humidity controls are still important factors. For the average punched card installation these things were considered luxuries, but for a computer system they are absolute necessities. The requirements vary with different systems.

The IBM RAMAC 305 has a heat dissipation ratio equivalent to five tons of air conditioning; the 705 III equals about 33 tons, and the 7070 requires 11 tons. When the latter is in operation the temperature must be maintained between 65 to 90 degrees and the humidity between 20 and 80 percent. Preferably, the air conditioning system should be located in an area near, and serve only, the EDP center. Most engineers recommend spare units as a precaution against shutdown should the air conditioning fail. While employes can "sweat-it-out," computers cannot.

The usual equipment for removing and controlling airborne moisture is seldom capable of providing the steady 50 percent humidity normally required for data processing operations. Special

Continued on Page 48

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Leading Defense and Business Organizations report:

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For More Information Circle Reader Service Card No. 169

Christmas Club checks are addressed automatically at high speed. Amounts are also entered automatically on the continuous tab card forms.

A Happy Holiday— Thanks to Automation

CHRISTMAS spirit has a new meaning at the First Trenton National Bank in Trenton, N. J. now that the annual rush and fuss connected with getting out Christmas Club checks has been eliminated. Automation and a new type of check take bows as the benefactors.

Issuance of these checks—there will be approximately 20,000 mailed this year—created a yearly headache by disrupting duties and schedules as well as forcing many hours of overtime.

At one time the checks were typed on paper forms, mailed and later sorted and counted by hand. When automation—in the form of tabulating equipment—was introduced, it became possible to make use of standard punched card checks.

William Stewart, supervisor of the tabulating department, is credited with the next advance since he brought Formscard checks into the picture. He first made use of them in 1958 when he needed a rush job for 2,000 dividend checks following a merger of two banking firms to form First Trenton National. He then decided to use them to facilitate the Christmas Club application.

The advantages of the new system are many and gratifying, Mr. Stewart emphasized. Punched cards are first prepared for every member of the Club. These hold the name, address and account number, and they can be prepared at leisure during the slow periods of normal office operation.

Wrong ones are pulled

About one month before the checks are to be mailed, another card is punched with account number and the amount of the check. The bank, Mr. Stewart explains, has learned that the large majority of customers who will stop making payments to the Club have done so before this time, or they will complete the full amount. However, any cards which may have the wrong amount are pulled during verification and new cards punched with the correct amount.

With this preliminary work out of the way well in advance, the only remaining steps are the production of the checks and the mailing. The two sets of cards are merged and run through an IBM 403 accounting machine which prints out the customer's name, address and amount payable on the Formscard checks—continuous tab card forms specially prepared for the bank by Forms, Inc. The checks are pre-punched numerically by the manufacturer, eliminating that keypunch operation entirely at the bank, and they have no medial waste strips, facilitating high-speed processing. Two persons can separate 2,000 addressed checks in a matter of 20 minutes, which means the whole job can be done in less than half a working day.

Because the Formscard checks are compatible with data processing equipment and numerically pre-punched, there is an additional time saving when the cashed checks are returned to the bank. They are run through a sorter and put into numerical sequence. After this they are automatically listed to determine which numbers are missing, if any, and a total obtained. The entire batch is filed, and the bank gets ready for another year's Christmas Club plan. ■

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Today, however, the Copyflo 1824 printer brings the same proportionate benefits to small-volume users as to large. No need now for vast files of engineering drawings. Microfilm aperture cards take only a fraction of the storage space required for other reproducibles. No more costly waiting for prints. And prints made by a Copyflo 1824 printer are so inexpensive, your engineers can discard them after use.

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For More Information Circle Reader Service Card No. 170

An Electronic First at First Pennsylvania

J. W. Hulton, vice president of the operations research division, checks the operation of the newly installed Magnetic Document Processing system.

AFTER a five year journey on the road to automation, the nation's oldest bank, the First Pennsylvania Banking and Trust Company, has reached its destination—a fully automatic, electronic bank bookkeeping system, first of its kind in the world.

The bank is currently processing some 56,000 special checking accounts on the new system in addition to revolving credit (a "ready money" plan for consumer loans), installment loans and mutual funds. Change-over for regular checking accounts and other applications is underway.

The new system, which William F. Kelly, president of First Pennsylvania, calls "the most flexible bank automation system yet devised," was designed, developed and built by Burroughs Corp. Actually, it is a marriage of two systems; one being the 220 computer with magnetic tapes and high-speed printers, and the other an entirely new Burroughs development—the B301 Magnetic Document Processing System. The 301 uses MICR (Magnetic Ink Character Recognition) encoded media and will electronically read checks and deposit tickets, edit the coded data, sort, accumulate totals, classify, print listings and convert acceptable data to magnetic tape for handling by the 220 computer and printers. Combining the 301 and 220 gives the bank a master system that can operate directly from paper tape, punched cards, magnetic tape and MICR encoded media.

All First Pennsylvania checks in the hands of depositors have been MICR pre-coded with the customer account number and bank routing symbols. As special account checks are received at the bank, they are run through an amount and account number printer (Burroughs P703) which provides both a proof and amount encoding in a single operation. Once fully coded and proven, the checks are fed into the sorter-reader (B101) which reads and processes the documents at speeds up to 1,560 items per minute. In addition to sorting the checks, the reader interprets each MICR symbol in 32 millionths of a second, transmitting the check data to the system's control unit.

This unit co-ordinates the sorter-reader operations with the Electrostatic Multi-printer (S801) and the magnetic tape units (B549) that make up the B301 system. The control unit simultaneously edits and tests the incoming data from the special account checks to determine item acceptance and distribution. It accumulates totals for settlement and control, directs sorting of the items and selects pockets into which they fall. The unit also controls the form in which data is fed to the electrostatic printer (so called because the printing process involves a static charge through special paper with powdered ink adhering to the charged area) for listing information.

"On us" is output

Output of the multi-printer is in the form of four printed tapes—a master list and three supporting lists which include "on us" items, unidentified items and exceptions. All four lists are printed simultaneously, 10 lines per inch, at the same speed as the sorter-reader—1,560 items per minute.

The master list provides a record of every item processed by the sorter in the same batch sequence

The B-101 Sorter-Reader in the foreground reads and processes checks and documents by means of Magnetic Ink Character Recognition.

Joseph A. Perret, assistant vice president, Electronic Data Processing Operations (standing), watches a console operation on the 220 computer.

that the items arrive from the clearing house or Federal Reserve bank. In addition, the list indicates the batch number, source code, cash letter total, customer account number and the amount of each item processed. A batch total is automatically balanced with the item total and either a zero settlement, or the difference, is printed on the master list before the next batch is processed. The settlement data is printed out at the rate of 3,000 words per minute. Only a fraction of a second elapses between batch operations.

Magnetic tape, produced as a by-product of the 301 operation, is processed through the 220 computer, with the high-speed printers turning out the finished customer statements.

First Pennsylvania's Senior Vice President, Alfred C. Graff, who has overall responsibility for the automation program, points out that all checks must still go through the traditional accounting steps, but with the new system they will be processed literally thousands of times faster and with greater accuracy. "In this case," Mr. Graff adds, "electronic automation has virtually eliminated any chance of human error."

More than 600,000 individual checks are received daily by First Pennsylvania's own Deposit Division, and some 175,000 customer checks and 25,000 deposits posted in an average day to deposit accounts. It was this staggering and growing volume of daily deposit activity that dictated the bank's move from conventional methods to a specialized high speed system.

After several years of preliminary study the "First" made its plunge into automation in 1957, according to John W. Hulton, vice president, Operations Research Division. At that time, in addition to working with the research facilities of Burrough Corp. on an exchange of information pertaining to data processing and computer operations, the bank began the task of recruiting people for the job of getting programs ready for EDP.

Twenty-five with a desire

Some 100 potential participants were drawn from throughout the bank for the program, and, after screening and testing, 34 were selected to take an 11-week training course conducted by Assistant Secretary Joseph E. T. O'Conner. From this group, 25 indicated a desire to continue in the automation project and were given additional training.

The 25 were split into a half-dozen groups for detailed computer programming. Each "team" consisted of a systems analyst or senior programmer who was the team leader, and a group of two or three programmers. Each team's function was to get its particular program on the 220 computer, and the team was required to do all the systems work necessary to accomplish the objective. While splitting the programming job among six operation research teams was an efficient approach, it was also apparent that each team could not have complete independence of operation, a condition that could result in six different system approaches.

To prevent this problem a "standards committee" was formed, with one person from each team, to standardize procedures and methods of flow charting, develop common methods of communi-

One of 25 Burroughs P 703 Account and Amount Imprinters which imprint the magnetic ink characters on documents not previously encoded.

cations, and decide upon uniform programming patterns. The committee developed a manual of standard procedures for programmers, and established a standard format for the writing of operation manuals.

The latter were essential because the bank's computer operations were divided into three shifts —day, twilight, and night. As Mr. Hulton explained, "the night group, for example, specializes largely in bookkeeping but unforeseen difficulties sometimes make it necessary for the day crew to handle the same work. Without standard communications and procedure manuals the morning shift might have difficulty continuing the efforts of the night crew."

The team effort covered a very comprehensive range. It involved sitting down with department heads and finding out what departmental procedures and what records and reports were required to do the best possible job — forgetting what the present situations were. Next the team had to develop the computer system, program, debug, and oversee the conversion from old to new.

Special checking accounts were the first to be automated. Punched cards were used to create a master file of customer names and addresses which was then converted to magnetic tape. The detail records were converted in numeric sequences by account number, ledger by ledger, or about 4,000 accounts at a time. As the conversion took place prior to the installation of MICR equipment, it was necessary to create paper tape for the ledger information entry into the computer.

For the first month the computer operation was a parallel run, with special checking accounts continuing to be handled by Burroughs Sensitronics in normal fashion. All controls from both systems were maintained in the bookkeeping department along with check files.

The bookkeeping research team continues to stay on top of the special checking operation to be sure of its continued accuracy and efficiency as well as continued close co-ordination between the bookkeeping department and the computer personnel. At the same time, the team is working on the regular checking program which is nearing the computer stage.

At the decision-making level

Mr. Hulton credits much of the bank's success in automation to an electronics data processing committee, headed by Mr. Graff. The committee consists of top operations people and group systems leaders. They meet every two weeks to review progress and remove any obstacles that may have arisen. Because the committee is at the decision-making level there is no need to defer problems pending consultation with superiors.

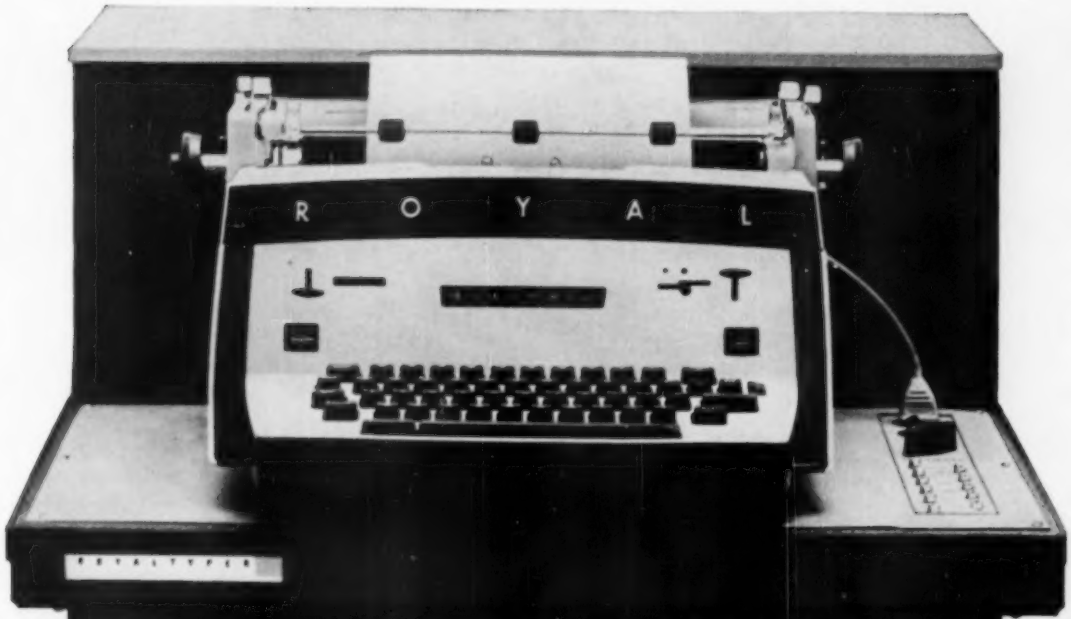
First Pennsylvania was chartered by the Continental Congress, December 31, 1781, and opened for business as the Bank of North America, January 7, 1782. It has merged with a number of banks during the century, the last merger being in 1955 with the First National Bank of Philadelphia. The "First" is Philadelphia's largest bank (it operates 39 branches in Greater Philadelphia) and ranks 20th in the country. It employs over 3,000 people and has assets in excess of $1 billion 200 million. The bank maintains 135,000 checking accounts and 91,247 savings accounts. Checks and items handled for the bank's customers during 1958 numbered 157 million, an average of 628,000 items for each working day.

First Pennsylvania's full system of automation has cost aobut $2½ million. Besides the 301 system the installation includes two 220 computers, two high-speed printers, two sorters and a battery of account and amount printers. The key advantage of the system is its flexibility. It has the "built in" ability to perform all of the bank's major operations as well as internal payroll, general ledger and account reconciliation.

According to bank officials, the new system has not eliminated any personnel even though it now only requires 35 people to do the work previously handled by some 300. The officials explained that the "displaced" people have been absorbed in other departments as part of the bank's growth movement.

Viewing the vast and intricate system that will ultimately bring complete automation to First Pennsylvania, one can share the opinion of Mr. Kelley: "now we are prepared to face the tremendous growth of paper work that is inevitable in the banking business in the years ahead."■

Finally, a single system automatic typewriter— it does its punching and its typing all with this one simple standard keyboard.



Its name is Royaltyper. Its maker is Royal McBee. It is brand new. Its cost is in line with suddenly outmoded two-unit systems.

Any typist can operate it, just as she operates her typewriter. Directions: roll in a piece of paper... flick a switch... type the first letter. This automatically punches the tape and the operator sees every word she is punching—no blind punching as in outmoded systems. Then the machine takes over—all by itself. At 135 words a minute all day long. Number of copies: unlimited. Number of rest periods: none.

Does your company ever have personalized first-copy mass mailings to get out? Is your company tired of paying the high cost of independent punching service, or of training employees to punch on complicated outmoded systems? Then get in touch with Royal McBee Corporation, Port Chester, New York, for full information on the brand new Royaltyper.

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For More Information Circle Reader Service Card No. 171

Integrated Time and Tab Cards Speed Job Costing

A battery of 19 elapsed time computers in the factory provide recording facilities for job cards. All work times are automatically recorded on pre-punched cards.

AUTOMATIC COMPUTATION of elapsed work time at the job level has expedited both payroll calculation and cost accounting procedures in the data processing department of Electro Dynamic Division of General Dynamics Corp., a prime supplier of Navy submarine motors and similar equipment.

By integrating the time card and machine accounting systems, the tab department now produces reports on inventory, accounts payable and its distribution, work in progress inventory, general ledger accounting, expense analysis, sales cost analyses and product cost analyses—made available to management on a daily basis.

Utilizing a battery of elapsed time computers in conjunction with an IBM machine accounting installation, the Bayonne, N. J. company has speeded up the gathering and preparation of the important cost information by eliminating many of the manual calculations and computations as well as the human errors involved in making these computations. Work activities of 450 salaried and hourly employes require the processing of approximately 160,000 cards each month, with an average of 1,800 to 1,900 punched cards produced daily for payroll computation.

All time recording (daily, job, rework and piecework) is clock-stamped on pre-printed punched cards by Calculagraph elapsed time computers located in each of the 19 departments of the factory. The computers (product of the Calculagraph Co.) are programmed to specifically deduct time for lunch periods, overnight idle time and any other non-working time. The unit prints only actual chargeable time to provide cost figures.

When processed through business machines, the elapsed time records provide information on the number of hours per job of any order going through the plant, leading eventually to inventory valuation. At the cost center level, they aid in determining how much time has been spent on a given job in each segment of the production process, permitting accurate costing and determination of production rates (quantity/time per unit). Elapsed time figures also permit costing of each basic production operation within each cost center. Time per individual machine is instantly available, and labor distribution or payroll records can be controlled.

From "start" to "finish"

An employe reporting for work at the start of the shift at Electro Dynamic takes a pre-printed daily time card from the rack, places it in the Calculagraph and pulls back a "start" lever. The machine stamps a clockface on the card showing the hour and minute the man started work. The employe also takes a Job Card, also pre-printed, from the rack and fills in the necessary details of

Job cards flow into the machine accounting department for processing to produce payroll, cost, inventory, accounts payable and other important information for management.

his first job—department number, his name and clock number, part number, shop order number, number of pieces and the operation number. He places this in the unit and it is similarly stamped.

When the job is finished, the job card is placed in the machine and a "finish" lever is pulled. Actual working time, less rest periods or lunch if these intervals occurred during the operation, is stamped on the card. Another job card is filled out and clock-stamped. If the job performed is on a piecework basis, a special color-coded card is used. In the course of a day, a man may work on both the hourly and piecework rates, with the color coding serving as a signal to the control.

All cards are collected daily and delivered to the payroll control clerk. He checks starting and finishing time and notes the elapsed hours on the cards, which are then keypunched with the necessary information. After they are verified, the cards are sorted according to job number and payroll number. Here the job cards rather than the daily time cards are used to compute wages since one man may work at several different rates during a day. After the wage computations are completed, the information is run through an IBM 402 which prints out payroll number, deductions for taxes, regular rate pay, overtime and premium or piecework pay plus the total amount payable to the employe.

The control clerk also runs a total of the elapsed time on the job cards against the daily time cards to determine unproductive time and to check the possibility of lost or misplaced job cards.

Distribution of direct labor costs to the individual work order accounts is accomplished by machine sorting the job cards to collect all labor expended on each work order. These cards are fed to the 402 to produce a printed record and at the same time summary cards are produced on a reproducing summary punch.

Time in focus with cost

To determine the total cost on any job, the work hours, overhead costs and sales expense chargeable to the work order are punched into cards. These are merged with the direct labor summary cards and run through the tab machines to determine total cost, whether at completion or at any point during manufacture.

Electro Dynamic is presently preparing the report information by using 19 of the elapsed time computers, three key punches, two verifiers, two sorters, one interpreter, two accounting machines, two collators, one summary gang punch and one reproducing summary punch.

This system has brought the time element into focus with cost by eliminating laborious arithmetic, a high error rate and the need for extra clerical help to handle the jobs.■

A simplified, external pinboard allows the operator to program this new desk-sized digital computer — the Burroughs E103 — bringing sophisticated EDP to smaller businesses.

An MBA Product Preview

E103—Burrough's Business Computer

A desk-size electronic digital computer — the E103—has been developed especially for business data processing by the Burroughs Corporation.

The unit will be particularly useful to smaller and medium sized business. Simplified external pinboard programming permits use of the computer with a minimum of operator training.

An accounting machine printer and a new control unit, to provide the programming flexibility, will be standard equipment on the E103. The machine's problem-solving capabilities may be extended by optional paper and/or punch card equipment for input and output. The general purpose computer will contain a magnetic drum memory with storage capacity of 220 "words" (each word consisting of 12 digits plus sign). It also contains built-in decision making abilities.

Burroughs systems specialists have developed a series of programs to apply the E103 to such data processing jobs as sales analysis, payroll, labor cost distribution, tax billing, dairy route accounting, bond yield and interest projection tables. Retail and wholesale merchants, financial institutions, industrial manufacturers and government agencies are among the enterprises that are expected to find the small computer practicable for their day-to-day data processing needs and accounting work.

Lease rates for the new computer will be $875 and it will sell for $29,750. The E103 supplements the E101 small size computer which Burroughs simultaneously announces will be reduced in price from $38,325 to $26,750.

The Series E machines fill the middle range between Burroughs F2000, an electro-mechanical business computer, and the B251, 205 and 220 computers, medium and intermediate scale electronic data processing systems used by bigger businesses. Circle No. 130

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DATA PROCESSING

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OFFICE EQUIPMENT MANUFACTURERS INSTITUTE OEMI

An MBA Product Preview

Remington Rand's Optical Scanning Punch Reads Mark Sensing

Any mark made with ordinary pencil can be read on this Optical Scanning Punch creating EDP input cards.

A new optical scanning device for data processing systems is announced by Remington Rand Univac Div. of Sperry Rand Corp. The Optical Scanning Punch is designed to read handwritten markings on a standard Remington Rand 90 column card and punch appropriate holes into the same card so that it becomes the source document.

No special pencil is required, and no special symbols are needed. The value of the mark is determined solely by its position on the card. Source documents can be prepared on the spot by operators, typists, clerks, dispatchers and receivers, and the reading and punching of documents are handled automatically by the machine. Cards are monitored on the punch for missing-mark columns and double-mark columns. The machine can be programmed either to stop or to segregate the error cards without interrupting the run.

As many as 40 columns of information can be marked on one side of a 90-column card. Suitable cards can be designed to provide 80 columns of marking by using both sides. Only a reasonable degree of precision is required to accurately mark the card. Cards are read at the rate of 150 cards a minute.

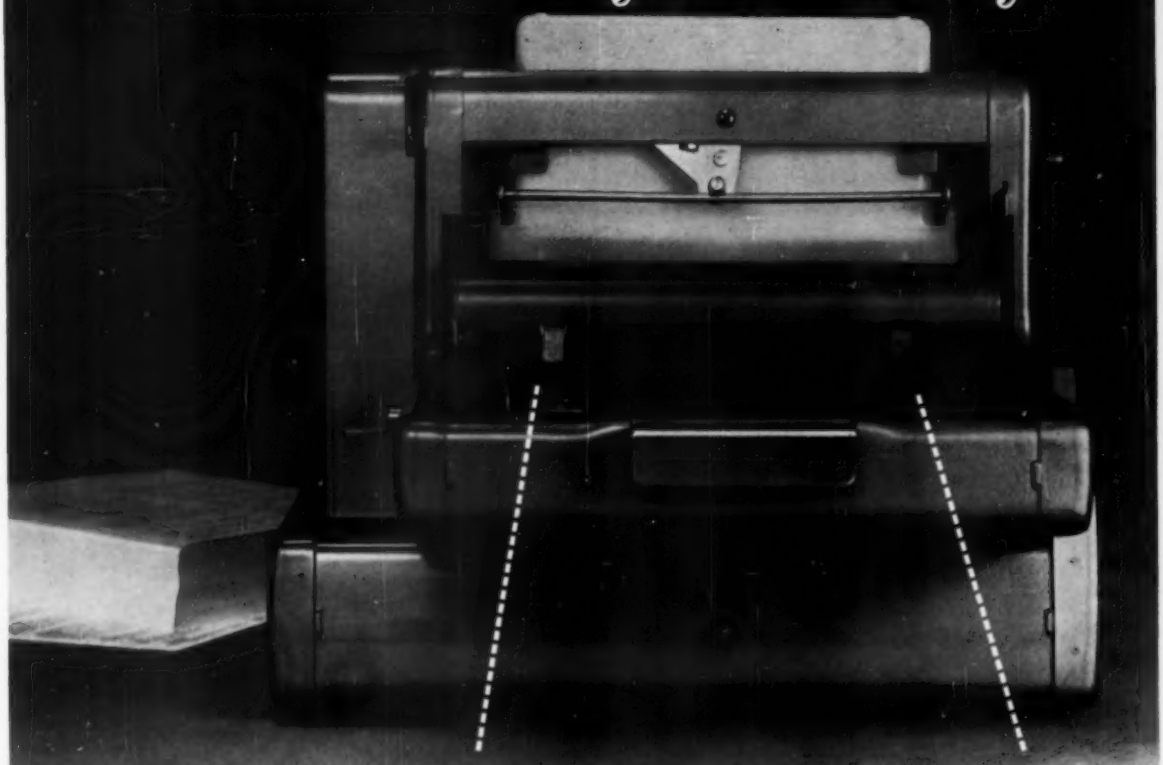
The machine is equipped with a sensitivity control mechanism which allows adjustment for cards bearing marks of varying density. It is then possible to process cards which have been too lightly marked or others which may be smudged by dirt or improper erasures.

The optical scanning punch has two principle controls. The supervisory console controls each machine function. Signal lights flash machine start and stop operations and indicate any marking errors according to their exact location and nature. The sensitivity control equips the optical scanning punch to read the varying marks of density.

The programming plugboard controls card punching format. The plugboards are interchangeable and program changes can be effected relatively quickly.

Additional features include repetitive punching from master cards, selective or gang punching, and segregation of selected cards. Circle No. 129

a full run for your money



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Here's a fluid duplicator that makes fast friends with everyone who wants good copies quickly and easily—without problems.

Nothing is left to chance. Metal corner paper separators guide paper on three sides when loading to assure accurate positioning on feed table. Teamed with dual feed rollers, they "deal out" a single sheet at a time—lightweight paper, heavy card stock, collated sets or even mixed, leftover paper.

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For More Information Circle Reader Service Card No. 172

The 1418 reader (left) translates numbers from typed or printed documents into machine language.

IBM Introduces An Optical Character Reader

An engineer inspects a reading station lamp which floods light on a document that is read by lens.

An MBA Product Preview

A major advance in computer technology was announced by International Business Machine Corp. with the introduction of its 1418 optical character reader. Both typed and printed business information can now be read directly into a computer memory for high-speed data processing.

The new solid-state unit reads numerical data printed in widely-used IBM type styles on paper or card documents, at a rate of 480 characters per second, or as many as 400 documents a minute. The data is automatically translated into machine language for direct input to an IBM 1401 computer.

The 1418 reads numbers printed 10 characters to the inch in a standard IBM type produced by 407, 408 or 409 accounting machines, the 1403 printer, or an IBM electric typewriter. It can also read numbers in the elongated 407 type style (commonly used by credit card imprinters) which is seven characters to the inch. In addition, the 1418 can be equipped for marking-reading—in which vertical markings made with ordinary pencil or dark inks represent specific information determined by the format of the document.

The optical character reader handles documents of various sizes and thicknesses, from bond paper to IBM card stock and forms from $5\frac{7}{8}$ to $8\frac{3}{4}$ inches wide by $2\frac{3}{4}$ to $3\frac{2}{3}$ inches high. Any printed documents within these dimensions — premium notices, imprinted charge slips, telephone bills, tax notices, coupons and continuous card forms, for example—can be used as direct input to the 1418-equipped 1401 system.

As the documents feed into the 1418, they are separated and aligned, one document at a time. Each form then feeds individually onto a revolving drum, where it is held flat by a vacuum. As the drum revolves, the complete surface of the form passes under a lens system.

The light image of a character is converted into electrical impulses which are compared and matched with internal logic patterns. Numerical characters are individually recognized and transferred one at a time to the magnetic core storage of the 1401 system. Circle No. 128

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Photo—Air Research Associates

An attractive, but functional environment is a necessity.

Computer Environment

Continued from page 32

equipment to correlate room temperature and humidity is usually necessary. If the computer is in a room with windows that are exposed to low temperatures, it may necessitate special window glass to prevent condensation. The "sweating" can increase the humidity problem.

Dust control is another item to be concerned with. Dust is inclined to gather under raised floors and must be removed before it circulates in the machine area. All tape should be stored in dust proof containers.

Location of the computer room has a direct bearing on air conditioning costs. Putting the computer in the basement of a twenty story building, for example, will require lines from a cooling tower on the roof, which will be an expensive proposition.

Room for spare parts

Over-all space requirements for an EDP operation will vary depending on the size of the system and the supporting facilities involved. Smaller units can be efficient in a space of some 400 square feet, while larger systems will require at least ten times that amount. Under the "total systems" concept the computer room becomes the center of all data handling. More and more firms are taking this concept into consideration when planning the physical layout for the EDP function.

The Pure Oil Co., in its new headquarters building, constructed recently in a Chicago suburb, has located the EDP department in the middle of its accounting and statistical operation. This minimizes the travel time of those involved in the function. The company has also located its duplicating and mailing rooms adjacent to the EDP area to further eliminate any delays in distributing the output of the data processing operation.

In considering total space requirements don't overlook the need for storage and stockroom space. Many valuable hours can be saved by having the necessary supplies stored within easy access of the EDP room. Where a large-scale system is concerned, there will also be need of sufficient space to house the spare parts and testing equipment of the customer engineers.

Give way to the rainbow

A very important item often overlooked is the need for safeguarding data against fire or water damage. Equipment can be replaced or borrowed without too much difficulty. Not so with cards and tapes containing valuable information. The cost of recreating such data, assuming it can be recreated, can be extreme, if not prohibitive. (See MBA, August 1959, page 46.) A fireproof vault for storage of tape and card records is a recommended addition to any EDP installation. As a further fire precaution, ample extinguishing equipment should be located in the EDP room.

The dull and drab greys and blacks, once the official colors of the machine accounting industry, have given way to the rainbow. As part of the environment investment most firms are using similar colors to add a bright and cheery atmosphere to the data processing area. Many personnel people feel that the use of these colorful decorative schemes will help reduce employe turnover in automated operations.

Visitors to electronic data processing installations are inevitable, and in most cases, desirable. A computer can have a tremendous public relations value and many firms are capitalizing on this fact. The EDP layout should allow visitors to view the operation without interference to the system. This is usually accomplished with long windowed corridors. Some companies have constructed visitor booths to provide a clear view of the operation. Some also use animated charts, tape recordings and other such devices to explain the workings of the system to visitors.

The cost of computer environment will vary greatly depending on the circumstances. Some experts use $25 a square foot as a reasonable estimate. Certainly the best bet for savings, both in time and cost, is to have the design and supervision of the installation architectural and engineering features handled by one co-ordinate organization. This assures close ties between the client, the architect and the electrical, mechanical and structural engineers, and guarantees a blending of the most desirable features of each field. ■

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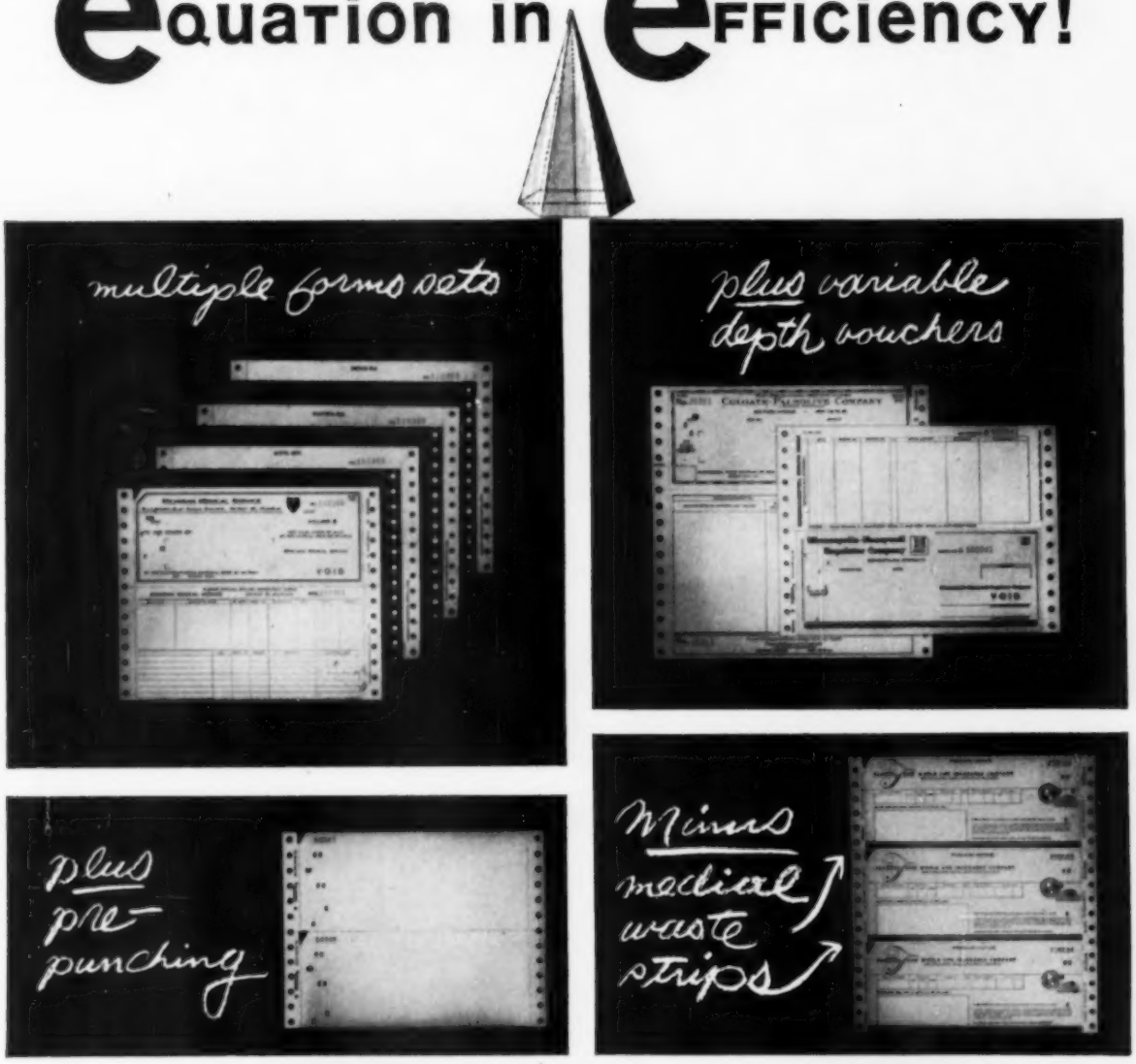

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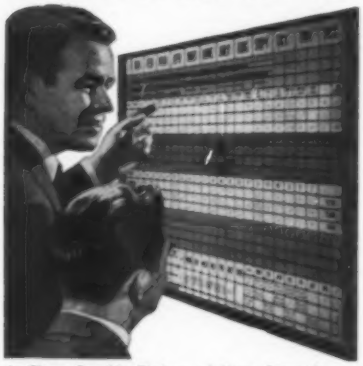

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GRAPHIC SYSTEMS

Yanceyville, North Carolina

Circle Reader Service Card No. 176

The new Raytheon electrostatic printer tubes can print three photographs in one second or 10,000 lines of computer information in one minute.

New Tubes Print Out 20,000 Characters A Second

FOUR NEW electrostatic printer tubes that can translate electronic signals, transmitted over telephone and telegraph lines or radio channels, into printed words and pictures have been announced by Raytheon Company's Industrial Components Division.

The printer tubes can deliver 20,000 characters per second or more than 10,000 lines of computer output information a minute, the company emphasized. This means they can print up to three 8½ by 11-inch sheets every second (photographs or words). The units resemble flattened cathode ray picture tubes with wire matrices across the faces. As the varying cathode ray beam currents inside the tube pass through the wire matrix, they deposit electrostatic charges on the paper as it passes against the tube.

Two of the tubes, the QV130 and the QV131, have three-inch matrices and were designed especially for label and short copy printing. They are planned for installation in addressing machines to print labels from information stored on tapes in data processing machines. This will make it possible to print two million different labels in an eight-hour day, or about 18 times faster than the system now in use.

The other two tubes, the QV132 and the QV133, are 10-inch models and can print electronically-stored or transmitted information on full-page sheets. These are destined for applications in police work (transmitting of photographs and fingerprints of suspects) and in many industries where operations are geographically separated from a home office control or data center. One application is the locating and directing of railroad freight cars. Closed-circuit TV units will spot the cars in a classification yard and flash a picture to the control center where it will be instantaneously and permanently printed on paper.

In industries with branch operations, bank statements, waybills, bills of lading, detailed handwritten records and photographs of persons receiving merchandise or cashing checks can be transmitted immediately between offices.

All four of the new tubes employ a medium persistence green fluorescence and have magnetic deflection and focusing. They are made with either one or 40 rows of wire elements and are available to customers' specifications within 60 days, the company stated. Circle No. 132

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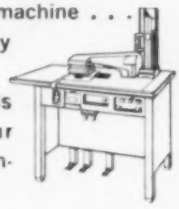

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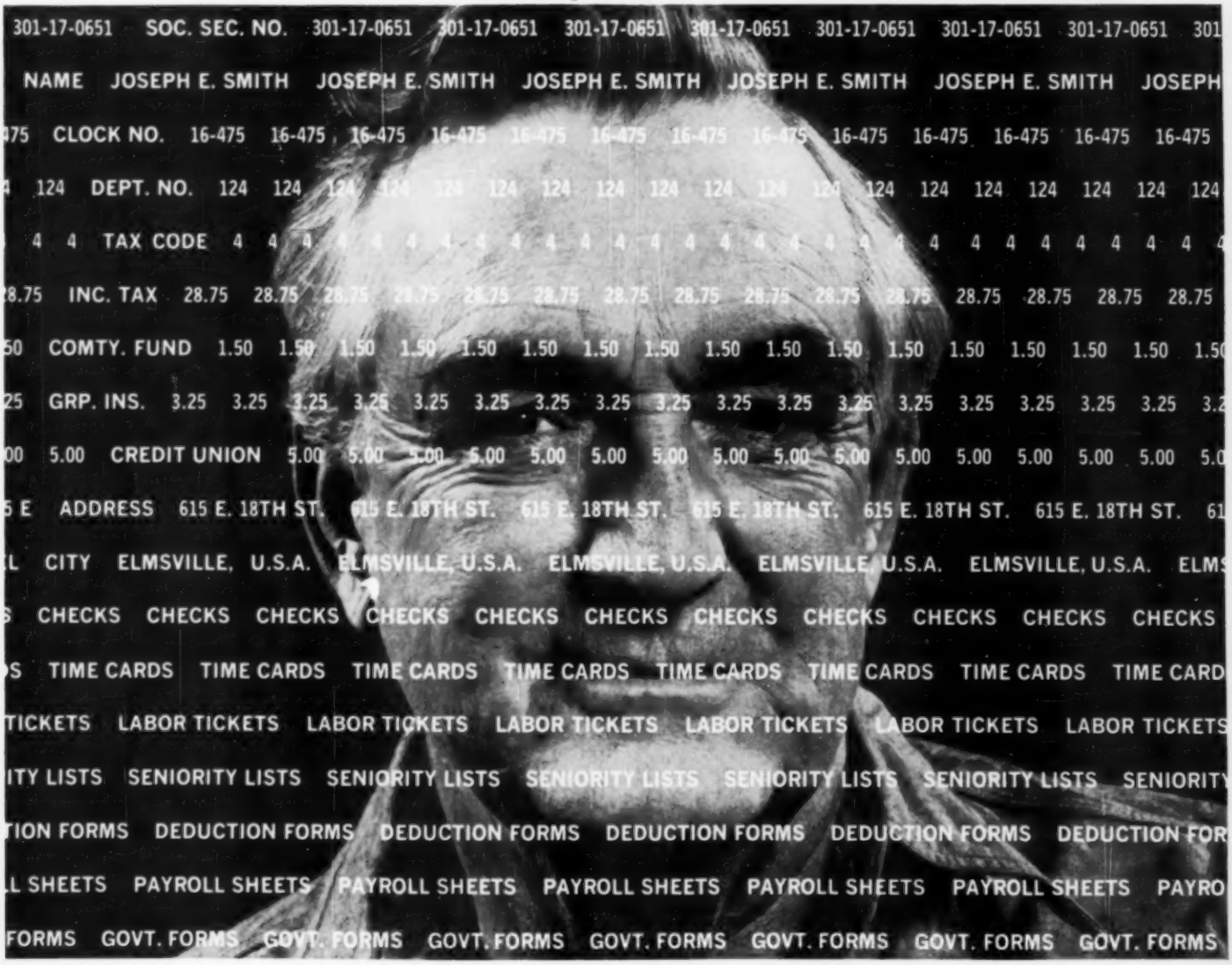
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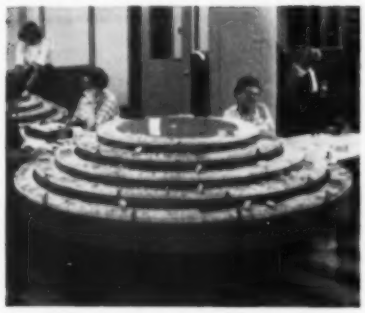
For More Information Circle Reader Service Card No. 177

MBA Showcase

New Products for Business Automation

Rotary File

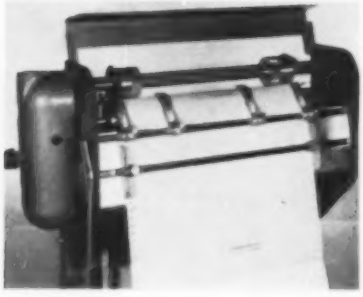


A rotary file unit with five step-back tiers that hold up to 125,000 visible record cards has been developed by Acme Visible Records, Inc. The unit is seven feet in diameter and can be operated by several clerks at the same time. Designed primarily for bank records, the file is actually engineered to fit the volume of records and limitations of space in the individual bank. The tiers rotate to the operator in three independently moving sections. Circle No. 118

Acoustical Unit

An acoustical enclosure, which rests on the machine, has been guaranteed to reduce noise, created by key punches, varifiers, tape-to-card machines and similar units, at least 50 percent by the manufacturer Gates Acoustinet, Inc. This table model Acoustinet Model IDP-100 has no legs and requires no fastening techniques. It checks office machine sound at its point of origin. Units include their own lighting, a tiltable shield to allow complete access to moving parts and features simple, modern styling. Circle No. 112

Forms Slitter



All-in-one performance is the feature attraction of this new power slitter used with auxiliary forms handling equipment. Introduced by the Standard Register Co., the low-cost, light weight (40 lbs.) slitter unit may be mounted on the company's Prebursting Decollator or Gravity Carbon Separator to facilitate the handling of large volumes of continuous forms. It is adaptable to the slitting of one or both margins as well as nonslitting operations such as separating crimped forms. Single and conjunctional slitting is another optional feature. These options do not inhibit other forms handling. Circle No. 117

Compact Portable Electrical Vari-Punch

Vari-Punch represents a new concept of key punching with a compact, portable unit. This electrically powered device is offered by the manufacturer, Varifab, Inc., in two production models. Model A will punch and print 40 column tab cards and Model B is capable of punching up to 80 column cards. A tab setting arrangement allows handling of cards of different column lengths. Visual control and accuracy is assured through printed numbers as well as punched holes. The "feather-light" keyboard has the standard ten-key arrangement, plus space and tab buttons. The Vari-Punch punches standard tabulating punched cards. Dimensions of the unit are eight inches long, five inches deep and three inches high. It weighs five pounds. The instrument may be powered by plugging it in an AC outlet. Uses for the Vari-punch may be with "on-the-spot" processing of cards in field and branch sales offices, ticket and collection offices, branch factories, tool rooms, shipping and receiving departments and production departments. Circle No. 104

Music and PA System

Background music in a controlled, self-contained system called Musi-Pak is available for business establishments and professional offices. Developed by Music-Pack Inc., the new system utilizes a continuous loop magnetic tape cartridge which plays continuously. The unit, about the size of a typewriter, can be purchased or leased. A microphone input jack facilitates its use for paging commercial announcements and other inter-business communications. Users have at their disposal a large tape library of background, mood and seasonal music. Circle No. 114

Remote Mike Dictator

The dictator and transcriber system called Stenomaster, Mark XII, by GBC America Corp., features a completely remote control mike, including automatic review. Four fingertip buttons on this mike permit remote control of starting, stopping, dictating, listening, back spacing, fast forward, automatic review and automatic erasure operations. A red warning light glows when in recording or erasure positions. A single reel records up to three hours of dictation. Two speeds, volume control, a built-in conference speaker, a clock-type tape index counter and compactness are among the features. Circle No. 111

Calculator Desk

A calculator desk has been added to Western Manufacturing Co.'s desk line as a companion to the No. 4063 bookkeeping machine and typewriter desk. A center drawer with pencil tray and automatic general lock, interchangeable side drawers that operate silently on nylon glides and an adjustable hieight of 29 to 30½ inches are among the new desk's features. A rubber grommet conceals the calculator's cord. Trimmed with solid brushed aluminum hardware the desk comes in Wesco standard finishes and colors such as grey, sage, sea mist green and olive green and has matching linoleum or textured tops. Circle No. 121

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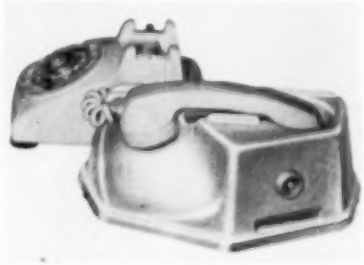
For More Information Circle Reader Service Card No. 179

Magazine Load Dictating

A dictating and transcribing machine which features tape magazine loading has been developed by the Dictating Equipment Division of North American Philips Co. The Norelco '75' eliminates the need for threading tape, since all the operator is required to do is drop the tape magazine into position to either record or listen. A microphone-telephone switch permits an instantaneous exchange from dictating to telephone-call recording, and a buzzer signals the end of the tape. Five controls handle record, playback, rapid review, fast forward and reverse, start, stop and volume. Circle No. 116

Telephone Amplifier



A new, low cost ($34.95) telephone amplifier, the Phonex, permits "hands free" use of the telephone for individuals or makes it possible for group conversations at one or both ends of the line. The device can be useful in areas where machine noise level may be high, such as in data processing installations, and it can facilitate users who may need both hands free for note taking or who must look up information in nearby files. This American made model is a product of the National Marine Corp. It is fully transistorized, completely portable and battery operated. Circle No. 127

Camera For Identification Purposes

Color or black and white photographs for identification purposes may now be taken by office personnel on the Identifax Camera, a product of Granflex, Inc., subsidiary of General Precision Equipment Corp. Designed for producing security badges for government, military and industrial applications, and pass book photos for athletic events or subscription series, Identifax is now being used by the state of Colorado on driver's licenses. Applicants fill out the prescribed form which is checked and placed before the camera. A simultaneous picture is taken of the information and the applicant. After the picture is taken, wallet sized ID cards-licenses are prepared and later mailed to the individual. Circle No. 109

Electro Kardex Mechanized Visible File

Electro Kardex, a mechanized visible filing system, exclusive with Remington Rand Systems Div., offers automatic positioning of card file trays at the push of a button on the selector panel in an average of four seconds. The slide containing a specific record is moved directly in front of the operator for quick reference and posting. The Kardex system is a visible filing method that has been used in commercial and government offices for some time. This advanced mechanized visible file may increase the reference-posting process in visible filing as much as 50 per cent, depending on the specifics of each use. Business has found the visible filing method useful in such applications as inventory control, personnel records and purchasing in the handling of records controlling credit, production, costs and sales. This self contained Electro Kardex compact work unit, housed in an area of 13.4 square feet of floor space, can hold more than 4,000 visibly indexed sets of 8 by 5 records filed under any one of hundreds of business adaptations. Circle No. 101

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- ☐ Please send me actual samples of your "Automatabels."
- ☐ Please send me Ever Ready's Label Idea Kit.

NAME ..... TITLE .....

COMPANY .....

STREET ADDRESS .....

CITY, ZONE, STATE .....

For More Information Circle Reader Service Card No. 182

Cable-Post Binders

Two new binders for housing marginal punched forms are featured by National Bland Book Co. These Cable-Post binders provide a flat opening needed for edge-to-edge reading. Steel cables sealed in nylon are said to be unbreakable even under heavy use. The locking mechanism permits loading or unloading from top or bottom and in combination with the Cable-Post Jr. storage binder the user is enabled to transfer records without removing them from the posts. The Cable-Post Jr. pressboard binder for storage records is available for both bursted and unbursted forms. It employs an inexpensive but efficient clip method of closure. It uses the same posts as the Cable-Post binder for current records and sheets can be transferred without removing them from the posts by changing the covers. Circle No. 126

Thermo-Fax Laminating

A method of laminating papers, letters, cards, charts, photographs and other written material or printed documents with "Thermo-Fax" copying machines has been developed by Minnesota Mining and Manufacturing Co. Originals and sheets are inserted in the copying machines to emerge a few seconds later bonded with a transparent seal designed to resist moisture, liquids, grease and smudges. Laminating film permits protection of frequently handled papers, prevents tampering of cards or identification and enhances appearance. Average cost of laminating both sides of an 8½" by 11" document ranges from 9 to 12 cents, and both sides are laminated in less than one minute. This process involves no special equipment or adjustments. Circle No. 115

Lightweight Post Binder

Substituting plastic in the place of steel, in the tubing that houses the lock mechanism of post binders, marks "the first advance in post binders in 40 years," according to Jack H. Behr, vice president of Wilson Jones Co. The company is now making a lightweight post binder made with the Cycolac plastic locking mechanism. The new binders will have the name "Cycolok." Besides being lighter, the plastic is rust and scratch proof and resistant to heavy impact. Designwise binders also blend well with the company's vinyl-guarded binder covers. Circle No. 123

Communications Transmission on Dictating Units

Mounted on a common base, two combination recorder-transcribers constitute the Message Recorder system conceived by The Sound-Scriber Corp. Relayed by telephone, messages are recorded on the system through an automatic internal dial telephone system. After one unit records the message a selector button is pushed transferring the line to the other unit. The first unit is free to transcribe, while the second unit simultaneously records another message. Applications might involve telegram transmission, department store buyer ordering or receiving department checking. One installation is already used in a large oil company. Audible and visual warnings show when recording is in progress. Plastic discs record up to 15 minutes on each side, in a compact unit of 21-¼ inches wide, 10-¾ inches deep and 6 inches high. Circle No. 103

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HASTINGS, MINNESOTA
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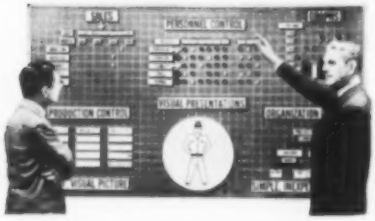
For More Information Circle Reader Service Card No. 184

VISUAL
MAGNETIC
CONTROL



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Over 100,000 users have *proved* Staplex's economy. Machines staple automatically—as fast as you feed them. No training needed. No drudgery. Write for details of this unique money-saving offer now.

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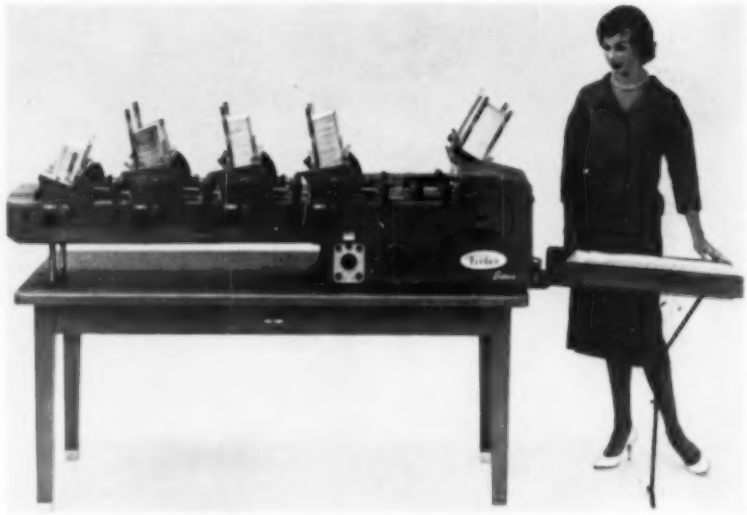
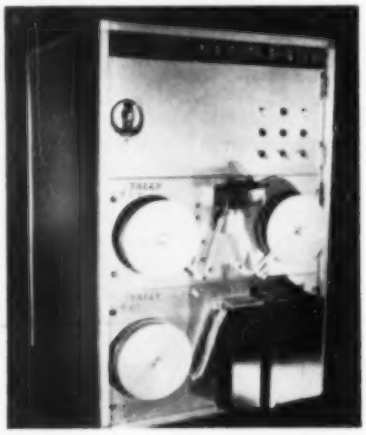
Circle Reader Service Card No. 186

Latest Model Friden-Ertma Mail Inserter



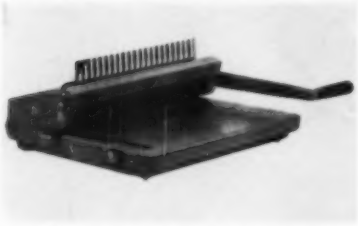
From one to eight feeding stations at "table-top convenience" are available on Friden-Ertma's latest version of their mail inserter. Various size inserts, including tabulating cards, may be stuffed into envelopes which are then sealed, counted and stacked in one continuous automatic operation. This model can take inserts as small as 3-3/16 inches square up to 9-$^{5}/_{8}$ inches by 6-$^{3}/_{8}$ inches. Punched tab card and open feeding stations may be added. At speeds of up to 6,000 envelopes an hour, this Swiss-made inserter can be operated by one person handling the work of up to eight people. The Friden-Ertma can pick up punched tab cards by means of a "knife-feed" device, no matter how many holes have been punched in the cards. A detecting device permits the unit to handle all weights, thicknesses and surface finishes of paper stock. Each station may be run independent of the other units. Circle No. 102

Paper Tape Translator-Converter



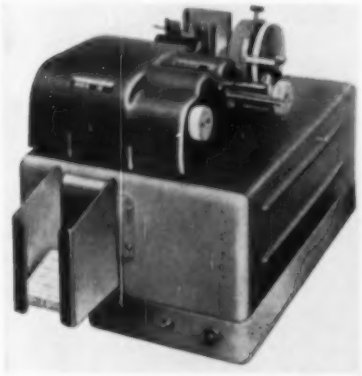
Combining a tape reader and a tape perforator, for tape to tape translation, low cost, high speed translation of paper tape codes and conversion of information between punched cards and tape, comprises the Tally Model 312 Translator. For the card-tape conversion system, a link through the Translator's logic section to an IBM 024 or 026 Keypunch is possible. All logic and control functions are performed by logic switch elements. The system performs paper tape code-to-code conversion at the rate of 60 characters per second. For tape-to-card/card-to-tape conversion approximately 20 card columns are translated each second—maximum speed of the IBM punch. A large plugboard capacity provides limitless translating possibilities depending on application. Components of the Model 312 system are: an IBM 024 or 026 keypunch for punched card input and output; Tally Register Corp.'s Model 420 Perforator-Reader in any code, five, six, seven and eight channel level, for paper tape input. Physical dimensions of the 312 system are 32 inches high, 20 inches wide and 22 inches deep, and it weighs 150 pounds. Circle No. 107

Plastic Punch-Bind Unit



Punching and plastic binding operations have been combined on a single chassis—the first of its kind, according to the manufacturer, American Photocopy Equipment Co. The portable, desk-top machine is low in cost, weighs less than 10 pounds and occupies approximately 15 square inches of desk surface. APECO's ComBind Bindak was designed to fill the need for a convenient method of producing plastic-bound materials, such as pamphlets and reports, for the average business. Anticipated uses are also for catalogs, surveys, proposals, manuals, market analyses and sales presentations. Circle No. 119

Numbering Print-Punch



Serially numbered, tag-sized basic input media may be produced on this new model Numbering Print-Punch machine announced by Dennison Manufacturing Co. This makes it possible to utilize multiple stub tag systems as basic imput media in data processing systems governing production control, inventory control, piece rate payroll, shipping control and inspection control. The machine produces either 20 or 26 digits of imprinted and code-punched data, plus a five-digit imprinted and code-punched serial number on each stub of a tag. Numbers to 999,999 or repeats are controllable. Circle No. 125

Copyflex One-Writing System Slashes Receiving Report Preparation up to 80%!

One writing or typing of information does it for purchasing-receiving paperwork when you use Copyflex copying machines!

With Copyflex, the purchase order is typed on a multiple-part form, and a reproducible copy sent to Receiving. Receiving information is added directly to this copy—extra columns provide for multiple receipts. Each time receiving data is entered, any number of Copyflex copies (white or color coded) can be made.

That's it! No preparation of separate receiving report forms. No rewriting or retyping of purchasing information. You speed flow of goods, slash clerical writing up to 80%.

Copyflex is best for systematized paperwork because it's flexible and economical—letter-size copies cost less than a penny each for materials. Why not put yourself on the receiving end of important savings by mailing the coupon, right now!

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I am the NEW SUPER-RITER Desk Pen, with the Extra Fine Point. I write neatly, legibly, smoothly, on visible record cards, charts, any small space. Auditors, Bankers, Bookkeepers, Secretaries think I'm tops.

Give me a try—YOU won't be disappointed! I come in red, green, blue, jet black ink. Postpaid anywhere in U.S.A. Your net delivered cost is:

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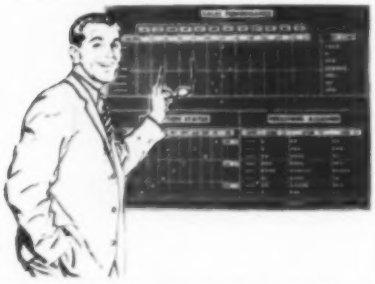
Circle Reader Service Card No. 188



"Maggie" Magnetic Boards Keep You on Top of Every Operation

"Maggie" Magnetic Visual Controls offer the easiest and quickest way to chart sales, traffic, personnel or any other phase of your business. Colorful, magnetic indicators tell you at a glance if everything is in the right place at the right time. No cards, pegs or other nuisance devices to replace because "Maggie" Board with magnetic indicators last indefinitely. Pays for itself many times over because the first cost is the last cost.

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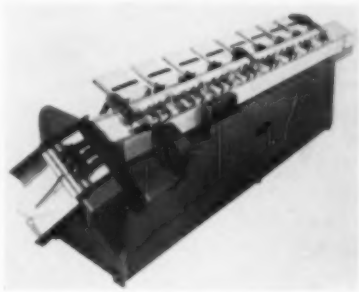
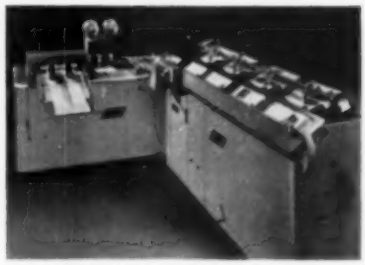
Circle Reader Service Card No. 189

Collator and Stitch-A-Fold Collator Combination



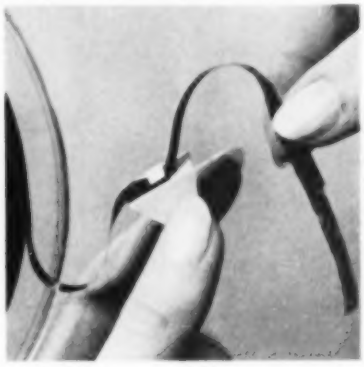


A one to eight station collating machine that gathers paper into sets and staples them is designed and priced for medium-sized offices. This product of the Macey Co., a subsidiary of Harris-Intertype Corp., handles stock ranging in quality and weight from onionskin to 1/8 inch hardboard. Each hopper holds up to 1500 sheets of 20 pound bond and operates at 2,600 cycles or 20,000 sheets per hour. One unskilled operator can set up and collate about 1,000 sets of eight sheets each in about 30 minutes. It will gather, staple and count papers in sheet sizes ranging from five by eight inches to nine by 12 inches. Automatic detection devices insure accuracy. Sales bulletins, price lists, management reports and other multi-page documents can be gathered by this collator. Macey Co. has also introduced to the business market a standard vacuum feed collator in combination with a Stitch-A-Fold machine. This combination is for the preparation of larger house organs, personnel booklets and catalogs. The unit will gather flat sheets into sets, center stitch material up to 1/16 of an inch thick and fold them into saddle stitched booklets. The speed range is 1,700 to 4,000 sets per hour. The Stitch-A-Fold may be separated from the collator. Circle No. 105

Telephone "Silencer"

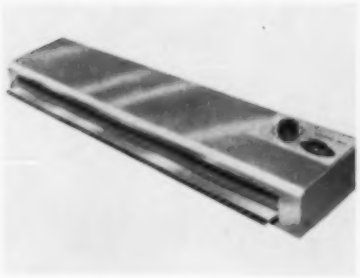
When telephone connections are poor or listening is strained by a high noise level background, an electronic device designed by an English electronics organization and distributed through its Canadian counterpart, Multitone Electric, Ltd., promises relief. The device, called Clarafon, is a tiny transistorized instrument which clips on and off any standard telephone receiver. Volume can be dialed so that only the voice at the other end is heard clearly. The instrument is useful in offices, tab rooms, data processing departments, computer rooms, plants and institutions. Circle No. 131

Magnetic Tape Clips



The new "Scotch" brand tape clip by Minnesota Mining & Mfg. Co. slips smoothly between the flanges of reels to hold loose ends of magnetic tape securely when the tapes are not in use. The thimble-sized plastic clips are presently available in packaged units, but they will soon be enclosed with each roll of 3M tape sold. Because they are plastic, the clips will not scratch the surface of the tape on the reel. They can be used on full or partial rolls. Circle No. 113

Rotary Diazo Printer



Announcement of a new high-speed model rotary diazo printer, to complement the one already in their line, has been made by Grico, Inc. The "Super Satellite," as it is called, may be plugged into any 115V outlet and is ready for use without warmup. It utilizes a single high-output fluorescent lamp enclosed in a transparent rotating cylinder. One control handles off-on, reverse and all speeds. The low-price, white printer produces copies up to 42 inches wide at the rate of six feet per minute. Grico's square ammonia developing tube permits easy insertion and removal of copy. Circle No. 120

Economical Tape Input Computer Model

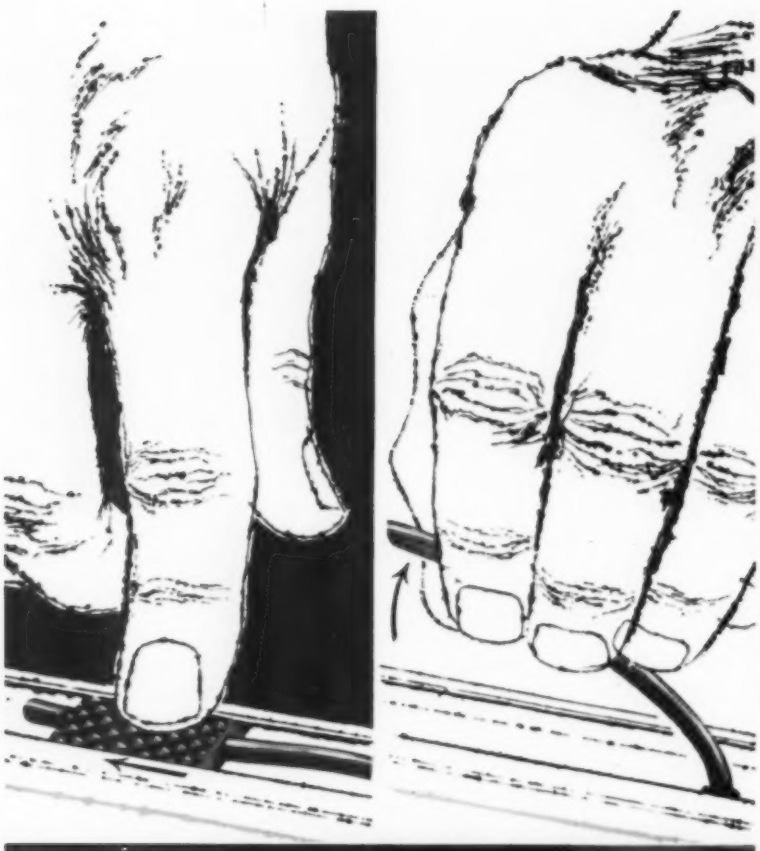
A new model of the IBM 1401 Data Processing System, with tape units of intermediate speeds has been designed for users who would like to convert from punched cards to tape, but do not require high speed tape systems. Key component of the 1401 E is a new, inexpensive IBM 7330 Magnetic Tape Unit. In a typical system, the 7330 will read data up to 20 times faster and write out results at more than 60 times the rate of punched card equipment. Monthly rental of the 1401 E will be approximately 16 percent more than the card input model, but the manufacturer, International Business Machines Corp., feels that the medium-size business will profit from the reduction in job time, simplified record storage requirements and increased data processing flexibility represented by the tape model. The 1401 E tape control unit, contained in the central processing unit, permits connecting up to six 7330's to the system, effecting interchangeability. Circle No. 106

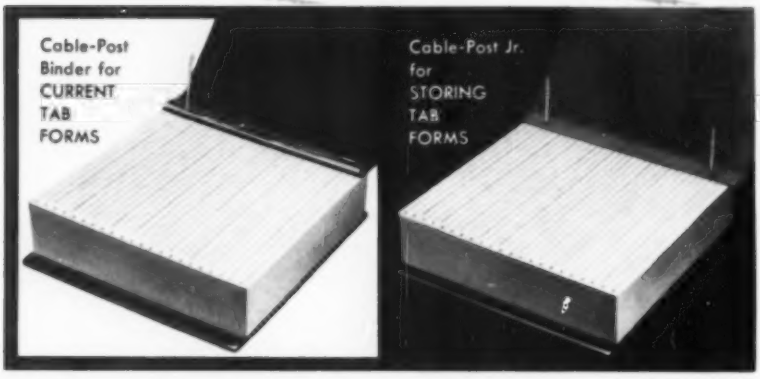
Paper Folding Machine

By automatically feeding, folding and counting 110 sheets of paper a minute and depositing them through a belt delivery into a stack in an adjustable receiver, the Conqueror automatic electric paper folder, made by Heyer, Inc., is designed to get short or long run folding jobs done quickly and accurately. The machine eliminates time consuming hand-folding of correspondence, invoices, promotional and other types of mail in offices, letter shops, direct mail organizations and printing plants. This heavy duty folder automatically feeds paper. Circle No. 108

ID Badge Reader and Manual Entry Keyboard

An employe's identification badge reader and a manual entry keyboard are an addition and an improvement on International Business Machines Corp.'s 357 data collection system. The 357 system is an in-plant communications network of reporting stations connected by cable to a manufacturing control system. The badge reader (shown left) is used for entering employe data for payroll and personnel purposes. The employe inserts a punched plastic card containing his number, department number and name together with a job card to enter job information. Additional variable information may be entered if the reader is used in conjunction with the 372 manual entry keyboard (shown right). This entry device features a "keyless keyboard" using vertical slides instead of keys so that production control figures may be checked visually before punch-printing them into cards. Circle No. 124.





Here's a $6.10 value for $4.00

Just to get introduced to you — These two binders are the best for marginal punched forms used with data processing equipment. Both binders have the same type of locking mechanism top and bottom. Just push the slides together. Up come the cable posts. Off come the covers. You can load from the top — unload from the bottom. When it is time to store the records, you change the covers instead of the sheets. Think of the time you save.

SPECIAL OFFER
Cable-Post Binder } $6.10 value
Cable-Post Jr. }
BOTH FOR ONLY 4.00

NATIONAL BLANK BOOK COMPANY
Dept. 1111, Holyoke, Mass.

Please send Cable-Post and Cable-Post Jr. Binders for $4.00. Sample sheet is attached or my sheet size is .....
My forms are bursted ☐ unbursted ☐
Name .....
Company .....
Street ..... City ..... State .....
My office supply dealer is .....
*Offer expires Jan. 1, 1961

For More Information Circle Reader Service Card No. 190

Copymate Photocopiers

Simple and economical photocopying as well as heavy duty reproduction are covered in the new line from Copymation, Inc. Models include the Copymate Jr. which handles originals up to 9 inches wide in any length and is portable; the lightweight deluxe model Copymate 9 (pictured above) with disposable plastic developer bag to eliminate mixing of chemicals; the Deluxe model Copymate 14, weighing 15½ pounds, with carrying handle and plastic developer bag, handling originals up to 14 inches wide; the Copymation Dart, a compact, high-volume, desk-top copy system for heavier duty copying; and the Photocopy Accessory for production of a secondary translucent film original for copies requiring a large number of prints. Write No. 110

Inventory Tag

Inventory tags that adhere directly to materials or containers are presented for use in office and industry by the American Tag Co. The pressure sensitive tags may be used to check and count content of stock or other information essential to inventory control problems. The bottom portion of the tag may be detached and retained by inventory personnel for designation or as a record for office files. Circle No. 122

Correction Fluid

A white correction fluid which will give greater visibility in correcting and proofreading white stencil sheets is now available from the developer of this new method, A. B. Dick Co., manufacturer of duplicators and supplies. It was developed especially for this purpose. Circle No. 133

Copies On Request

Micro-Reproduction System—Based on speeches by Department of Defense spokesmen, a six-page folder discussing the new standards and specifications of that department's engineering data micro-reproduction system is available from Minnesota Mining and Mfg. Co. Circle No. 140

Small Business Accounting—Application Report No. 13 from the Bendix Computer Div. tells how the Bendix G-15 computer brings low-cost electronic data handling to accountants serving small businesses. Circle No. 141

Tape-to-Card Converter—A complete description of Systematics Inc.'s C750 Universal Code tape-to-card converter is available. Circle No. 142

Reversible Tray Filing System—The Tabtray system of filing and new equipment involved in the process is discussed in a booklet from Tab Products Co. Circle No. 143

'300' Photocopier—Full information on the new Cormac '300' model photocopier with Flo-Tronic Control including specifications and uses is available in a folder from the manufacturer. Circle No. 144

Control Tape—Fibre control tape is explained as to specifications, sizes and advantages in a bulletin from the makers of "Peerless" tape—the National Vulcanized Fibre Co. Circle No. 145

Tab Card Forms—A booklet entitled "Get More Results From Your System" is available from Uarco Inc., and explains how tab card forms are incorporated into business systems. Circle No. 146

Engineering Reproduction—A case study of how Baldwin-Lima-Hamilton Corp. effectively combines two photographic techniques in making many required copies of engineering drawings. Offered by Anken Film Co. Circle No. 147

Balanced Data Processing—A pamphlet from IBM describes components and capabilities of the IBM 7070 and 1401 systems. Outline sheets with application listings for the manufacturing, brokerage, banking, public utility and and insurance industries are provided. Circle No. 148

Magnetic Ink Printing—A newly published "Question and Answer Book About Magnetic Ink Printing" has been prepared on behalf of the banking industry by Moore Business Forms, Inc. It tells how to print and process bank forms. Circle No. 149

Christmas Giving Solved—Busy executives may learn of an easy and economical way to give a variety of business gifts by the "Gift-Bookard" method offered by Gallery of Gifts, Inc. Circle No. 150

Here's a sure way to speed data processing!

SHELBY "CARD-SETS" OPEN NEW
VISTAS IN COST SAVINGS
FOR MANY COMPANIES
Shelby "Card-Sets" feature convenient "Thumb-Notch"* carbon extraction.

Licensed by IBM

*Pat. Pend.

Card-Sets combine tab cards and carbon copies into manifold sets to speed written transactions and provide all tab card data at the time of the transaction. Transcription errors are eliminated and the key punch operator's output is greatly increased. With the tab card as its own source document, search and recheck time is also eliminated.

Wide latitude in specifications

- 2 to 4 part sets
- 1 or 2 tab cards per set
- Loose sets or sets bound in books
- Consecutive or serial and check numbering
- 51 column or 80 & 90 column sizes
- Printing front and back, 1 or 2 colors
- One-time carbon, coated one or both sides
- Manifold carbons for bound sets
- Colored papers or ink for identification
- NCR paper (no carbon required) available
- Stubs at either end

THE SHELBY SALESBOOK COMPANY · SHELBY, OHIO

manufacturers of a complete line of data processing forms

For More Information Circle Reader Service Card No. 191

NEWS

Three Computers Are Set to Pick Winners on Election Night

Officials of two of the three major networks who will utilize computers to tally and forecast election results check out the equipment. Above, Walter Cronkite (left), E. E. Lindstrom and Howard K. Smith check the 7090 operation. Below, Dause L. Bibby (left), president of Remington Rand Div., explains Univac I tape units to Oliver Treyz, president of the ABC TV network.

An expectant nation may know the identity of the next president within an hour or so after the polls close. This is the goal of the TV networks, who will each employ rival computers in an all-out bid to be first with the winner.

The Columbia Broadcasting System in New York will put two powerful IBM computers to work early on election day—a solid state 7090 and a Ramac 305. The American Broadcasting Co. will pin its hopes on a veteran of several prediction contests, the Remington Rand Univac. The National Broadcasting Co. will utilize the RCA 501.

All three networks have made elaborate and costly plans for the election night highlights, as have the computer companies.

For over a year, IBM mathematicians have been researching, interviewing and gathering the data needed to program the 7090. They've consulted with political scientists at 16 state universities to get detailed information concerning the political, economic, social and religious makeup of 500 representative precincts and 75 marginal Congressional Districts. Newspapers, periodicals, books and official documents have been searched and scoured for election data going back as far as 1928—the year of the Al Smith-Herbert Hoover campaign.

The "Q and A" game

All of this is now "memory" in the 7090 computer, and as the returns roll in, CBS newscasters will tap this information to obtain answers to many specific—and vital—questions.

"How solid is the South voting?" "How is Senator Kennedy doing compared to Al Smith?" "How is Nixon faring compared with Gen. Eisenhower in 1956?" These questions will be answered.

As returns come in from the wire services and CBS telephone cor-

respondents located in 50 state capitols, twelve keypunch operators will punch the data into cards which will be dropped onto high-speed conveyor belts and whisked to the Ramac located in the CBS newsstudio. In a three-second sequence, the Ramac will check to see if incoming information is the most current available, update all appropriate records if it is, print out national reports for correspondents, state reports for regional desks, and flash the latest national results on a lightboard for the video audience. The same in-put card information used by the Ramac will be flashed via transceivers to the 7090 located at IBM's Madison Ave. headquarters. CBS commentators will be able to query the computer and receive answers over Tele-processing circuits.

Remington Rand's Univac located at the company's N. Y. service center, will be primed with some $500,000 of election data programming which involved the efforts of 100 researchers, programmers and computer experts, who have been active on the project since last spring. Besides naming the next president, Univac will also predict the number of states to be carried by each candidate, their total electoral and popular vote, the mathematical odds in favor of the leading candidate, and the outcome of the Senate and House races.

"Operation ballot"

Research consultant for the Univac project is Dr. Max Woodbury, professor of mathematics, New York University College of Engineering, who developed the formula for use in predicting the election results. Hour by hour status of the vote in past elections was determined and analyzed. Statistical analysis of past results in key areas were made to determine what results would be indicative of final outcome, and what areas could be watched for any unique trends, switches in voting strength, and other fluctuations. Even the weather conditions were taken into account.

Within 38 seconds after receipt of election returns at NBC election headquarters, in Rockefeller Center, the information will be fed into the 501 computer located at the RCA Electronics Center in Wall Street. Team of programmers from RCA and C-E-I-R, the nation's largest independent research and computer services firm, have translated a mathematical model of U. S. voting habits into more than 20 computer programs, requiring over 100,000 operations to enable the 501 to process the election returns.

The "operation ballot" team analyzed the voting habits of each state's population by geographical areas, degree of urbanization, occupation, income levels, age, religious affiliations and many other groupings. According to Arthur A. Katz, RCA project manager, these analyses provide the computer with information on the character "mix" which produces a Republican or Democratic vote.

The year-long project to program the 501 computer was directed by C-E-I-R's Dr. Jack Moshman. The project also had the services of Richard C. Scannon, one of the top authorities on American elections.

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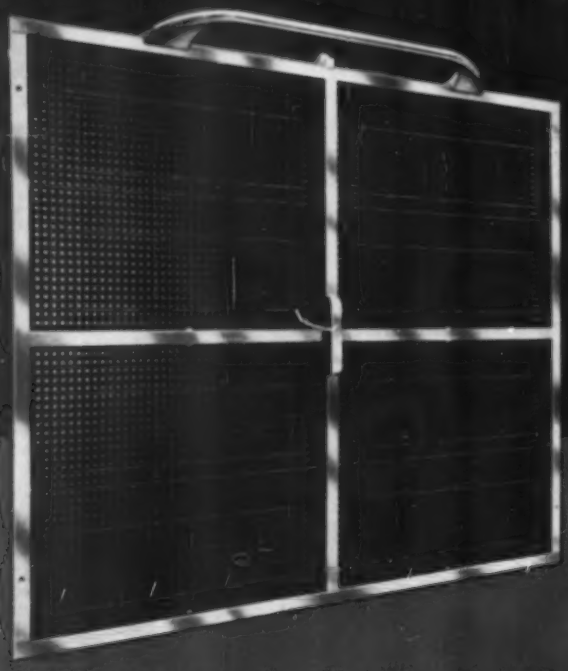

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A homesite sale completed in any of the Mackle Co. branch offices is flashed to the headquarters in Miami, Fla. and then reported to all other branches to avoid customer-irritating duplications.

Customers in any of 12 states who wish to purchase homesites in Florida from the Mackle Co. and General Development Corp. are now provided with up-to-the-minute information and faster service thanks to a 12-state automatic communications system.

Sales headquarters in Miami and nine development sites are linked with branch and realty offices in 12 eastern states by a Private Line Teletypewriter network utilizing an 83B2 teletypewriter system engineered by the Long Lines Department of the American Telephone and Telegraph Co.

When a sale is made in any of the branch offices, the details are put on paper tape and placed in a transmitter which automatically delivers the message to the Miami control office. In turn, the headquarters office flashes a broadcast of the message to all points on the circuit, preventing duplicate sales.

Among the Florida communities the company has under development are 92,500-acre Port Charlotte on the Southwest coast; the 36,500-acre Port St. Lucie site and the 45,000-acre Port Malabar site on the Atlantic coast, and other community areas in Port St. John, Sebastian Highlands, Vero Beach Highlands and Vero Shores and Pompano Beach Highlands.

Controllers Meet In San Francisco

The domestic and foreign business outlook, profit planning and management planning were among the topics discussed at the 29th annual International Conference of the Controllers Institute of America, October 23-26 in San Francisco.

Among the speakers were: Roy Reierson, vice president and chief economist of the Bankers Trust Co., New York; H. G. Vesper, president of Standard Oil Co. of California; H. W. Crandall, manager of Standard's electronic computer center; J. S. Seidman, immediate past president of the American Institute of Certified Public Accountants, and Dr. Nicholas Nyardi, director of the Institute of International Studies at Bradley University.

Raytheon Purchases Panels Wires Inc.

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WU to Expand Microwave System

Western Union has given a contract to Raytheon Co. to produce, install and place in service more than 30 microwave radio stations to provide feeder service linking six major cities into the company's main long-haul microwave line.

Cities tied into the main line, which runs from San Francisco to Los Angeles on the West Coast and across country to Boston and New York, include Denver, Kansas City, St. Louis, Syracuse and Buffalo.

Traffic on the new system will consist of combinations of voice channels, facsimile carrier channels for printer operations and high speed data.

EDP Machine Operators Organize New Society

The National Society of Electronic Data Processing Machine Operators and Programmers was organized last month in New York City.

The society was created "to promote the parts and sciences, standards and practices connected with the management, programming and operating of computers and data processing machines, foster technical education and advocate the exchange of knowledge between members of the society and allied professions."

Annual dues has been set at $2.50, and persons interested may write the Society at 22 E. 17th St., New York 3, N. Y.

RCA Announces COBOL Narrator

The Electronic Data Processing Division of RCA has announced the development of the RCA 501 COBOL Narrator, a programming system that utilizes simple English words to instruct a computer.

COBOL (Common Business Oriented Language) was created by a committee of computer manufacturers and users to provide a standardized language that would be interchangeable among systems of various manufacturers (MBA, March '60).

The RCA system, designed for use initially with the company's 501 computer, will permit computer instructions in the form of simple words such as "payroll file," "wage," "tax," and verbs such as "write," "read," "divide."

These words are punched on paper tape by a machine resembling a typewriter. They are then transferred to magnetic tape and fed into the computer for action—translated into machine instructions.

Ampex-Telemeter Magnetics to Merge

Directors of Ampex Corp. and Telemeter Magnetics, Inc. have adopted a resolution recommending merger of Telemeter into Ampex.

George I. Long, Jr., Ampex president, commented that "the merger will strengthen the ability of Ampex to serve the memory requirements of data processing and computer systems manufacturers."

Control Data to Supply New Computer to NCR

National Cash Register Co. and Control Data Corp. have entered into an agreement whereby Control Data will supply NCR with a new type of low-cost, solid state computer and related equipment.

Under terms of the agreement, NCR will market the small computer in the United States, for certain applications. In retailing, as an example, the computer will process punched paper tape created by various tyes of National "input" equipment, such as cash registers, accounting machines and adding machines.

C-E-I-R Orders STRETCH System

C-E-I-R, the nation's largest independent business research and computer services firm, has ordered a STRECH-class computer, IBM's most powerful.

Recent Appointments

H. B. Rice

Responsibility for the planning and installation of Illinois Bell Telephone Co.'s large-scale computer systems has been assigned to a department headed by Herman B. Rice, recently promoted to assistant comptroller—data processing.

Reporting directly to Mr. Rice is Donald R. Klusman, appointed director of EDP planning. He will be responsibile for developing computer methods, programming, training personnel and planning the physical layouts for the computer installation.

next month . . .

ADP and Strategic Airlift

Business data processing provides the vital reports and records necessary for the Military Air Transport Service (MATS) to move men, weapons and material by air to any spot on earth.

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Shell Oil reveals new system for electronic capture of "raw" management data.

MBA's Calendar

November 3-4—The Third Annual National Conference and Technical Exhibit of the American Production and Inventory Control Society. Sheraton-Cadillac Hotel, Detroit, Mich. National Headquarters: 330 South Wells St., Chicago 6, Ill.

December 3-6—International Visual Communications Congress, sponsored by the Society of Reproduction Engineers and the Association of Professional Draftsmen. Sherman Hotel, Chicago. Write: V.C.C., 10600 Puritan Ave., Detroit 37, Mich.

December 13-15—The Eastern Joint Computer Conference (EJCC). New Yorker Hotel, New York City. Contact: Dr. Nathaniel Rochester, IBM, Yorktown Heights, N. Y.

January 9-11—The Seventh National Symposium on Reliability and Quality Control, sponsored by the American Society for Quality Control, the Institute of Radio Engineers, the American Institute of Electrical Engineers and Electronic Industries Association. Bellevue-Stratford Hotel, Philadelphia, Pa. Address inquiry to: Mr. James H. Goodman, RCA, Building 1-2, Camden, New Jersey.

January 16-19—The Instrument Society of America's Winter Instrument-Automation Conference (Sheraton-Jefferson Hotel) and Exhibition (Kiel Auditorium) in St. Louis, Mo. For Information: William H. Kushnick, Executive Director, ISA, 313 Sixth Ave., Pittsburgh 22, Pa.

February 1-3—The Second Winter Military Electronics Convention (MIL-E-CON) sponsored by the National Professional Group on Military Electronics and the Los Angeles Section, Institute of Radio Engineers. Write: IRE Business Office, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

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An MBA News Feature

Two Major Programs Aimed at Standardizing Business Equipment

John H. Howard is director of the data processing standardization program sponsored by the OEMI.

TWO BROAD programs for the international standardization of office machines and data processing equipment—including electronic computers—are progressing under the sponsorship of the Office Equipment Manufacturers Institute.

Both programs are being organized under procedures set up by the American Standards Association (ASA), which is composed of over 110 national technical societies and trade associations and serves as the United States member to the International Organization for Standards (ISO).

In announcing the sponsorship, Alfred J. Ball, OEMI president, stated: "It is impossible to overestimate the value these two programs will have to both customers and manufacturers. In tangible terms, the results will be reflected by savings of millions of dollars annually for the customers of our industry. In less easily defined terms, the effect on our national gross output—through the establishment of highly efficient standards for office equipment—will be readily apparent."

At the same time, Ball announced the appointment of John H. Howard as director of the data processing standardization program. Howard was formerly employed as manager of the Burroughs Corp. Paoli (Pa.) Research Laboratory. Dr. Joseph Barker, who has been acting director of the data processing program, will continue as consultant to the Institute and offer guidance in both the data processing and machine standardization areas.

The data processing program, dubbed X3, involves the development of: (1) a standard set and coded representation for the character set—including the alphabet, numerals, special symbols and marks by which information is made machine readable (MBA, Sept. '60 pictured and described various type fonts proposed by manufacturers of optical scanning equipment—page 29); (2) a standard format for defining the meaning of strings of characters into data fields, data records and program instructions; (3) a common problem-oriented programming language (MBA, March '60—

Dr. Joseph Barker will act as consultant to the OEMI.

COBOL) governing the operation of data processing equipment. This language would be machine-independent so that it would be applicable to data processing equipment of various manufacturers. The purpose is to establish a common language in which to describe the processes to be carried out, and (4) precise definition of data processing operations at machine level to insure identical results for dif-

ferent equipment when using the problem-oriented language.

The Institute has selected six manufacturers, seven "user" groups and seven "general interest" groups to participate on the X3 committee. The manufacturers group, all from OEMI membership, is represented by B. W. Pollard, Burroughs Corp.; I. C. Liggett, IBM; E. A. Emerson, National Cash Register; Dr. J. C. Chu, Univac-Remington Rand Div. of Sperry Rand; J. T. Davidson, Standard Register Co., and A. C. Reynolds, Stromberg Div., General Time Corp.

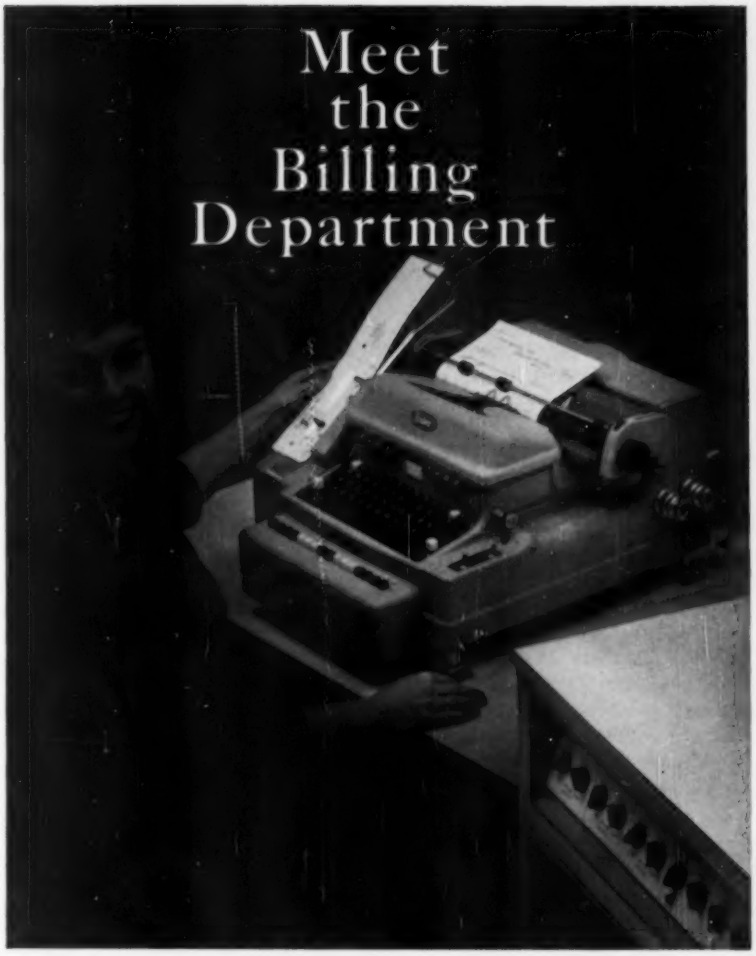
X4 for machines

Among the users and general interest group represented are American Bankers Association, National Retail Merchants Association, American Management Association and the National Machine Accountants Association.

Carl P. Ray, vice president of Royal McBee Corp., is directing the organization of the office machines program, known as X4. Serving with him are T. M. Butler, director of engineering for Burroughs; Fred Roberts, v.p. engineering, Dictaphone Corp.; L. A. Bechtel, Jr., manager of sales research and planning, IBM; E. G. Frye, head of accounting machine product planning for National Cash; A. J. Weitzel, general sales manager of typewriter and supplies, Remington Rand, B. L. Hinman, manager of engineering and research, Uarco, Inc., and James Vincent, manager of market research, Underwood Corp.

The office machines program will relate to the establishment of standard terminology and definitions, standard output formats defining characters and symbols and other fundamental elements of interest to users and manufacturers of office machines and related supplies.

The board of directors of OEMI, trade association of the office equipment industry, has given top priority to the standardization programs. Approved standards, resulting from the programs, will be submitted to the ISO as the basis on which international standards can be developed.



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MBA Reviews

Determining Salaries For Computer Personnel

By Philip H. Weber. Published by Management and Business Automation, 600 W. Jackson Blvd., Chicago 6. $5.00.

This handbook represents the first organized and complete guide to developing a wage structure for computer department personnel.

This introduction to basic problems in determining salaries and procedures for establishing a position evaluation program is designed to aid administrators in approaching or reviewing salary determination in this area.

The heart of the book contains full statistics from the first national computer salary survey (published by MANAGEMENT AND BUSINESS AUTOMATION in June, '60 issue). Not only does this information aid salary administration by area and industry, but median salary charts and fold-outs provide quick use of the information. Another valuable result is the first standardized position description of 29 specific computer jobs from manager of computer operations to control clerk.

Ideas For Management

Edited by W. R. Amos. Published by The Systems and Procedures Association, 4463 Penobscot Building, Detroit, Mich. $16.00.

The Twelfth International Systems Meeting was divided into three sections; Systems Panorama, Systems Seminars and Systems Futurama. This volume is devoted to current and advanced systems thinking in the management field.

The 1959 ISM is covered in 573 pages of text and illustrations and is useful to top management, controllers, systems men, accountants, office managers and other progressive executives.

The panorama section includes papers on forms design, manuals, procedure analysis and work simplification. Seminars were held on work measurement, operations research, organization planning, punched card data processing, communications and human relations. The futurama was devoted to advanced and coming problems and their solutions. This book is meritorious and practical.

Office Salaries

Published by the National Office Management Association, Willow Grove, Pa. $30.00.

This guide to 1960 salary rates of office personnel includes 23 positions from clerks, secretaries, telephone switchboard operators to tabulating machine operators and calculating machine operators.

Salary information is extensively categorized by nation, city and area in tabular form. Information included besides salaries is with regard to benefits, paid vacations and averages of groups and regions. The study is very specific and should be useful as a statistic for lower echelon personnel salary determination.

Information Processing

Published by Unesco, Oldenbourg, Butterworths. Distributed by International Documents Service, Columbia University Press, 2960 Broadway, New York City 27. $25.00.

Proceedings of the International Conference on Information Processing, Unesco, Paris, June 15-20, 1959 are now available in print.

This impressive publication is a compilation of works heard by 2,000 top experts from 39 countries, under the Presidency of Dr. Howard H. Aiken, of Harvard, making possible, for the first time, a full and free discussion between experts on recent developments and the current state of research throughout the world, in the area of computer technology, developments and business and scientific usages.

The contents include the broad headings: methods of digital computing; common symbolic language for computers; automatic translation of languages; pattern recognition and machine learning; logical design of computers and the special session on computer techniques of the future.

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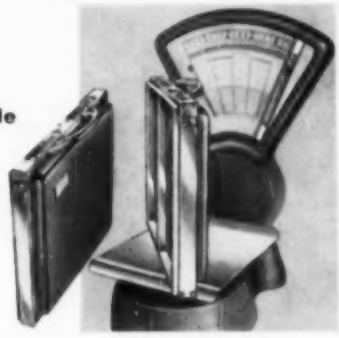

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EDITORIAL

Computer Spectacular

TV viewers will be treated to a "computer spectacular" on election night as the rival networks each seek to be first with the electronic nod to our next president (details on News pages). The nod may come earlier in the evening than most people expect. So early, in fact, that the newcasters may not have the fortitude to announce the electronic decision.

Such was the case in 1952. Only two hours after the first polls closed, and with just 3,400,000 votes in from scattered eastern states, Univac gave 100 to 1 odds in favor of Eisenhower and forecast he would capture 438 electoral votes against 93 for Stevenson. Univac was unaware that the political pundits had predicted a close race, and the consternation caused by its first prediction was considerable; so great was it, that Mr. Murrow went on the air without a cigaret.

Since all the experts looked upon this prediction with incredulity, it was agreed to change the national trend factor from the 40 percent shift to Republicans—as computed by Univac—to four percent, and then to ask the machine to recompute. The results of the corrected computation gave a more "realistic" prediction, according to the experts, and the hedged totals were announced to the viewing public.

Shortly thereafter, it became clear that Univac's 40 percent trend factor had been right on the button. As it turned out, the actual result of the election was 442 electoral votes for Ike and 89 for Adlai. Univac had been within four electoral votes of the final outcome on its first prediction of the evening.

This year three computer manufacturers expended over a million dollars and many man years of programming time to assure an early, accurate prediction. The reasons behind these huge outlays of time, talent and equipment is twofold. One is to prove the feasibility of election forecasting; the other—and this is of far greater importance—is to forceably demonstrate the tremendous potentials of electronic data processing in the field of business forecasting. The same techniques used in the election programming can spot immediately any change in the business pattern of an organization, allowing management to make decisions on current events rather than on undependable historic facts.

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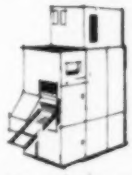

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